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ABSTRACT

The second of four documents provides a summary of the scientific literature pertaining to spontaneous language acquisition in handicapped preschool children, and reviews and evaluates procedures for assessing language acquisition in these children. Chapter 1 focuses on language development in nonhandicapped children after they have acquired their first word to the time they begin school. The skills that are acquired by nonhandicapped children during this relatively short time period are reviewed for handicapped children in Chapter 2. Sections in this chapter focus on the following specific handicapping conditions: acoustically handicapped, neurologically handicapped, emotionally handicapped, and mentally handicapped. Also addressed are the effects of institutionalization, influence of brain damage, Down's syndrome children, developmental delay vs. specific deficit, and the critical period. Chapter 3 contains a review of some of the issues, assumptions, and current approaches to language assessment in young children. The assessment paradigm, test standardization, phonological assessment, morphological and syntactic assessment, vocabulary and basic concepts assessment, global language tests, and communication assessment are considered. Appendixes contain specific descriptions of speech and language assessment procedures grouped into general development and performance, global language, phonological, morphological, and syntactic, and vocabulary and basic concept assessment procedures. A bibliography completes the document. (Author/SBH)

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Language Acquisition and Assessment in Normal and Handicapped Preschool Children: A Review of the Literature[1]

FINAL REPORT - VOLUME II

by Thomas M. Longhurst, Ph.D.[2]

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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PREFACE

The purpose of this report was to provide a summary statement of the scientific literature pertaining to spontaneous language acquisition in handicapped preschool children and to review and evaluate procedures for assessing language acquisition in these children. From this review has evolved an assessment of problem areas in the literature and suggestions for further research.

This report contains three major sections or chapters: Language Acquisition in Normal Preschool children, Spontaneous Language Acquisition in Handicapped Preschool Children, and Language Assessment.

The first step in compiling a review such as this is to define some terms and attempt to delineate what the breadth of the review should be.

For the purposes of this report language is functionally defined as an arbitrary system comprised of sets of vocal symbols which represent a conceptual system used by man to communicate. Language is divided into various levels including articulation and phonological skills, grammar including syntactic and morphological skills, vocabulary skills, and knowledge of basic concepts. The development of these skills was reviewed as they are realized in two language processes; production and comprehension. The uses that the child puts his language skill to in interpersonal communication were also reviewed.

Since the emphasis was on spontaneous language acquisition, this report contains very little literature that deals with aided or facilitated acquisition, e.g., language that is being trained.

Chapter 1 focuses on nonhandicapped children after they have acquired their first word to the time they begin school. This brief chapter was provided as a benchmark against which to judge language acquisition in handicapped children. The skills that are acquired by nonhandicapped children during this relatively short time period were reviewed in handicapped children in Chapter 2. Obviously the chronological age at which the handicapped child acquires the language skills of the nonhandicapped 5½ year old may be into the teens and most handicapped children never acquire the same facility. The focus of the review of spontaneous language acquisition in handicapped children was on preschool children. However, since most of the literature dealt with school-age children and because most school-age handicapped children are still acquiring the skills that were acquired by the preschool nonhandicapped child, the chronological age range in Chapter 2 was extended up to include the early school years.

Chapter 3 contains a review of some of the issues, assumptions, and current approaches to language assessment in young children. Our emphasis again was on preschool aged children.

Appendices A through D contain specific descriptions of speech and language assessment procedures grouped into general developmental and performance, global language, phonological, morphological and syntactic, and vocabulary and basic concept assessment procedures.

The bibliography contains sources referred to in the report as well as additional relevant references.

Nonvocal means of communicating including gestures, writing and reading have been excluded from our definition of language and are generally omitted from this report.

Also excluded is literature that specifically relates to language in bidialectual, bilingual, or economically disadvantaged children. It also excludes literature not published in English and generally excludes articles that relate to children learning languages other than English.

Chapter 1 NORMAL LANGUAGE ACQUISITION

The failure of children to acquire language is one of the mysteries that has drawn intensive scientific inquiry over the past three decades. For all this effort, relatively little is known about how language is acquired in normal children and even less is known about language acquisition in handicapped children. There are a number of theories to explain language acquisition, or the lack of it, and there is considerable controversy concerning descriptions of the language and its use.

This chapter is designed to present a brief introduction to the structure of the English language and to review the normal development of language in children from the time they acquired their first word until they enter school.

We have specifically avoided lengthy discussions of theories of language acquisition, major controversies in the description of the language, and related issues such as peceptual or cognitive development.

The purpose of this chapter is to provide the reader with definitions of terms, a general linguistic background for the later chapters, and a brief introduction to language acquisition in nonhandicapped children to facilitate one discussions of language acquisition in handicapped children and language assessment in Chapters 2 and 3.

LEVELS OF LANGUAGE

Language is usually divided into three levels: phonology, syntax (including morphology). and semantics. We will also describe the use of language in communication or pragmatics. Before a discussion of each of these levels in more detail we will provide a brief definition of each.

Phonology

Phonology can be defined as the study of the acoustical characteristics of speech or the sound system of a language. It is concerned with the relationship among individual linguistic elements and their realization in sound. Speech Pathologists often use the term phoneme to mean speech sound, however to the linguist a phoneme is an abstraction and as such cannot be produced. To the linguist, a phoneme is the name of a group or family of speech sounds that do not signal or change in meaning (Gleason, 1961; Hockett, 1958). Phones are individual members of a phoneme family and are the actual produced speech sounds. Usually speech sounds are classified by place and manner of articulation (Hopper & Naremore,1973) or by their distinctive features (Chomsky & Halle, 1968).

Actually, phonology is divided into the study of two types of phonemes; segmental and suprasegmental phonemes. Segmental phonemes are the vowels and consonants while suprasegmental phonemes include the pitch, stress, and juncture of an utterance. Pitch is the relative tonal height of an utterance. Stress is the relative degree of intensity of an utterance. Junctures are the points of pause in connected speech. Pitch and juncture provide the intonation patterns of English. Changes in pitch, stress, or juncture contribute to the meaning and intelligibility of an utterance.

Syntax and Morphology

Syntax is the sentence producing process and is concerned with the order in which the elements of a language are arranged and the relationships of the elements in sentences. It is with syntax that the greatest amount of interest has been directed. Morphology, usually discussed as a subtopic of syntax, is the study of the smallest meaningful units of a language, or morphemes. Thus, morphology is that part of language that constitutes the rules for word making. Usually morphemes are divided into two classes; bound and free morphemes. Bound morphemes are described as word inflection to mark tense, number, case person, possession, and comparative or superlative. They must be "bound" to free morphemes which make up the words in the vocabulary.

Semantics and Vocabulary

Semantics is concerned with the meanings of words and sentences and how the meanings of these words and sentences are related. We know relatively little about the semantic level of language and even less about the development of semantics in children. We know quite a bit about vocabulary acquisition but little about how the words in the child's vocabulary acquired their meanings or how these meanings are related or categorized.

Pragmatics and Communication

The use of language is a topic somewhat apart from the structure or content of the language itself. To be an effective communicator that child must not only learn the rules of language but the rules for using language for social interaction within his linguistic community. This area has received very little attention in the literature but is an important topic of consideration especially when discussing handicapped children.

PHONOLOGICAL DEVELOPMENT

For the purposes of this report we have made a distinction between the early prelinguistic vocalizations of infants before word production and sound production after the acquisition of words. This later development is usually referred to as phonemic development (Taylor & Swinney, 1972; Winnitz, 1969). Winnitz (1969) has provided a comprehensive summary of the studies in this area.

Phonemic Mastery

There have been a number of large normative-longitive or normative-crossectional studies of phonemic development (Pool, 1934; Templin, 1957; Wellman, Case, Mengert, & Bradbury, 1931).

These investigators have generally shown that mastery of articulation is essentially complete by CA 8. Table 1:1 shows the number of items correct out of a possible 176 items reported by Templin (1957). Table 1:1 suggests that

Table 1:1

Mean Total Articulation Scores for Boys and Girls, Upper and Lower Socioeconomic Status Groups, and Total Subsamples by Age

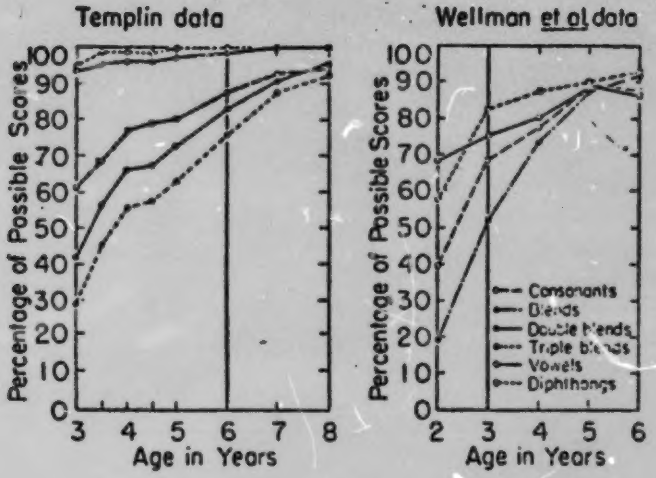
Source: Templin, Mildred C. *Certain Language Skills in Children*, Institute of Child Welfare Mono. No. 26, University of Minn. Press, Minneapolis (1957).

	Boys (N = 30)		Girls (N = 30)		USES (N = 18)		LSES (N = 42)		Total Subsamples (N = 60)	
CA	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
3	98.3	35.0	88.2	31.8	97.6	33.1	91.5	34.0	93.3	33.8
3.5	105.5	37.6	118.2	31.0	115.9	31.7	110.1	36.5	111.9	35.0
4	127.2	31.6	125.5	26.7	136.1	18.9	122.2	31.8	126.4	29.3
4.5	127.2	32.2	131.2	29.5	141.7	29.8	123.8	29.9	129.2	31.0
5	128.8	33.1	141.8	33.9	146.9	26.3	130.3	39.1	135.3	36.7
6	143.7	33.8	156.9	21.8	154.5	28.9	140.4	42.7	150.3	29.2
7	157.3	21.7	166.4	10.8	167.8	11.4	151.4	38.9	161.9	17.7
8	167.6	8.6	166.6	13.2	169.7	7.3	166.0	12.3	167.1	11.1

sound mastery is approximately 53% complete at age 3 while approximately 98% at age 8. There is considerable variation in the younger age but this decreases over time. The differences between sexes were not statistically significant.

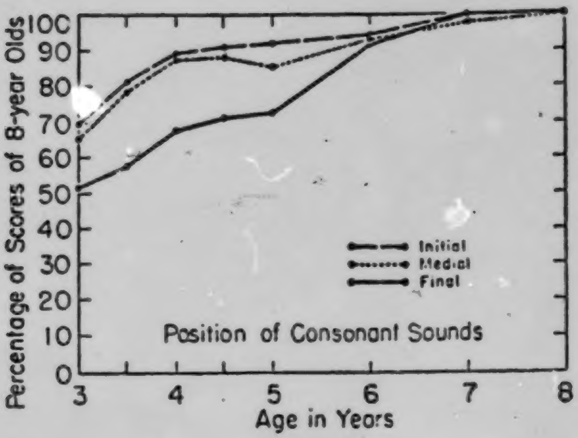
Figures 1:1 and 1:2 and Tables 1:2, 1:3 and 1:4 show that mastery for certain sounds or sound classes occur at different ages. Figure 1:1 shows that vowels and dipthongs are mastered first with consonants and consonant blends following. Figure 1:2 shows that sounds in the final position are mastered last. Table 1:2 shows Templin's (1957) ages at which 75 percent of her subjects produced individual sounds correctly while Table 1:3 compare the same data from the Templin (1957) Wellman, et al. (1931) and Poole (1934) studies. Table 1:4 shows the ten most frequently misarticulated sounds from several studies.

Elements and Blends, Vowels, and Diphthongs by Age
as Reported by Templin and Welman



Source: Templin, Mildred C. Certain Language Skills in Children, Institute of Child Welfare Mono. No. 26, University of Minn. Press, Minneapolis (1957).

Figure 1:2.Percentage of Scores of the 8-Year-Old Subsample Taken as a Measure of Terminal Status on Initial, Medial, and Final Consonant Elements by Age



Source: Templin, Mildred C. Certain Language Skills in Children, Institute of Child Welfare Mono. No. 26, University of Minn. Press, Minneapolis (1957).

Table 1:2. Earliest Age at Which 75 Per Cent of All Subjects Produced Each Tested Sound Element Correctly

CA	Sound Elements
3	Vowels: ē, ĭ, ĕ, ă, ŏ, ŭ, ŏŏ, ōō, ô, ō, ä, ûr Diphthongs: ū, ā, ī, ou, oi Consonants: m–, –m–, –m, n–, –n–, –n, –ng–, –ng, p–, –p–, –p, t–, –t, k–, –k–, b–, –b–, d–, –d–, g–, –g–, f–, –f–, –f, h–, –h–, w–, –w– Double-consonant blends: –ngk
3.5	Consonants: –s–, –z–, –r, y–, –y– Double-consonant blends: –rk, –ks, –mp, –pt, –rm, –mr, –nr, –pr, –kr, –br, –dr, –gr, –sm
4	Consonants: –k, –b, –d, –g, s–, sh–, –sh, –v–, j–, r–, –r–, l–, –l– Double-consonant blends: pl–, pr–, tr–, tw–, kl–, kr–, kw–, bl–, br–, dr–, gl–, sk–, sm–, sn–, sp–, st–, –lp, –rt, –ft, –lt, –fr Triple-consonant blends: –mpt, –mps
4.5	Consonants: –s, –sh–, ch–, –ch–, –ch Double-consonant blends: gr–, fr–, –lf
5	Consonants: –j– Double-consonant blends: fl–, –rp, –lb, –rd, –rf, –rn, –shr Triple-consonant blends: str–, –mbr
6	Consonants: –t–, th–, –th–, –th, v–, –v, th–, –l Double consonant blends: –lk, –rb, –rg, –rth, –nt, –nd, –thr, –pl, –kl, –bl, –gl, –fl, –sl Triple-consonant blends: skw–, –str, –rst, –ngkl, –nggl, –rj, –ntth, –rch
7	Consonants: –th–, –th, z–, –z, –zh–, –zh, –j Double-consonant blends: thr–, shr–, sl–, sw–, –lz, –zm, –lth, –sk, –st Triple-consonant blends: skr–, spl–, spr–, –skr, –kst, –jd
8	Double-consonant blends: –kt, –tr, –sp

* hw–, –hw–, –lfth, and –tl are not produced correctly by 75 per cent of the subjects by 8 years of age.

Source: Templin, Mildred C. Certain Language Skills in Children, Institute of Child Welfare Mono. No. 26, University of Minn. Press, Minneapolis (1957).

Table 1:3. Comparison of the Ages at Which Subjects Correctly Produced Specific Consonant Sounds in the Templin, the Wellman, and the Poole Studies

Age Correctly Produced

Sound	TEMPLIN (1957)	WELLMAN AND OTHERS (1931)	POOLE (1934)
m	3	3	3.5
n	3	3	4.5
ŋ	3	—[a]	4.5
p	3	4	3.5
f	3	3	5.5
h	3	3	3.5
w	3	3	3.5
j	3.5	4	4.5
k	4	4	4.5
b	4	3	3.5
d	4	5	4.5
g	4	4	4.5
r	4	5	7.5
s	4.5	5	7.5[b]
ʃ	4.5	—[c]	6.5
tʃ	4.5	5	—[c]
t	6	5	4.5
θ	6	—[a]	7.5[b]
v	6	5	6.5[b]
l	6	4	6.5
ð	7	—[c]	6.5
z	7	5	7.5[b]
ʒ	7	—[c]	6.5
dʒ	7	6	—[c]
hw	—[a]	—[a]	7.5

[*] In the Wellman and others, and Templin studies a sound was considered mastered if it was articulated correctly by 75 percent of the subjects. The criterion of correct production was 100 percent in the Poole study.

[a] Sound was tested but was not produced correctly by 75 percent of the subjects at the oldest age tested. In the Wellman data the "hw" reached the percentage criterion at 5 but not at 6 years, the medial "ŋ" reached it at 3, and the initial and medial "θ" and "ð" at 5 years.

[b] Poole (Davis, 1938), in a study of 20,000 preschool and school-age children reports the following shifts: "s" and "z" appear at 5.5 years, then disappear and return later at 7.5 years or above; "θ" appears at 6.5 years and "v" at 5.5 years.

[c] Sound not tested or not reported.

SOURCE: Templin, M. C. Certain language skills in children, their development and interrelationships. *Institute of Child Welfare, Monograph Series,* No. 26, 54. Minneapolis: University of Minnesota Press, 1957.

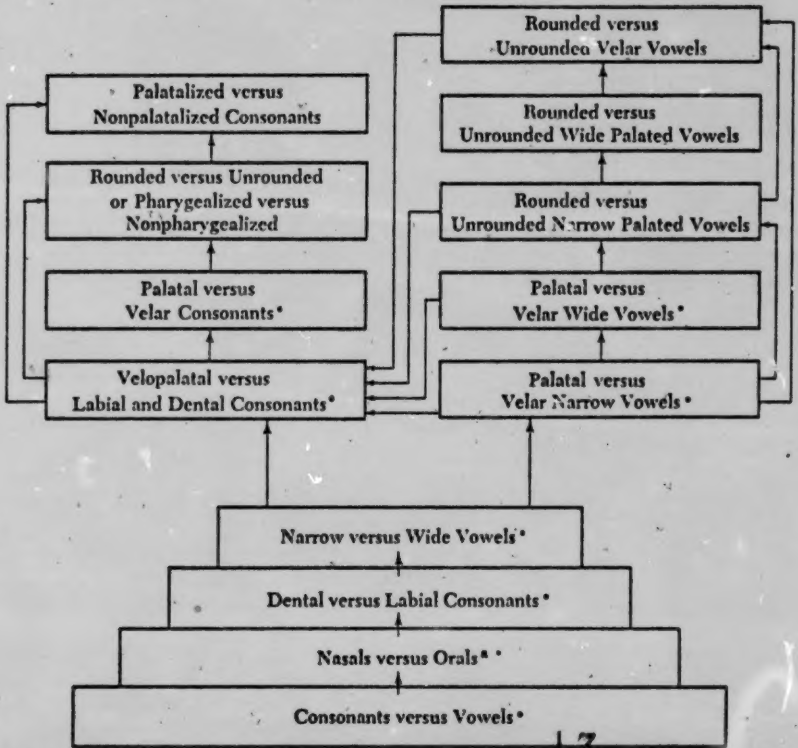
Distinctive Features

Jakobson and his colleagues (Jakobson, 1962, 1963, 1968, 1969, 1971; Jakobson & Halle, 1956; 1971; Jakobson, Fant, & Halle, 1963, 1956) have claimed there is an identifiable hierarchy of phonological features that are distinctive in English speaking children. Thus individual sounds may be grouped or categorized on the basis of these features. Table 1:5 shows that broad sound classes occur early in phonemic development while increasing more specific

TABLE 1:5

Pictorial representation of Jakobson and Halle's model for the development of phoneme contrasts. Some contrasts are prerequisites for other contrasts. These prerequisites are indicated by an arrow. For example the fourth contrast, Narrow versus Wide Vowels, cannot occur until the first three contrasts are learned. After the Narrow versus Wide Vowel contrast is learned, one of two contrasts is learned: either Velopalatal versus Labial or Dental versus Velar Narrow Vowels. From here on the reader can trace the phoneme splits that can occur, using the arrows to direct himself and remembering that not all contrasts occur in every language.

SOURCE: Adapted from Jakobson and Halle, 1956.


Rounded versus Unrounded Velar Vowels
Palatalized versus Nonpalatalized Consonants
Rounded versus Unrounded Wide Palated Vowels
Rounded versus Unrounded or Pharygealized versus Nonpharygealized
Rounded versus Unrounded Narrow Palated Vowels
Palatal versus Velar Consonants*
Palatal versus Velar Wide Vowels*
Velopalatal versus Labial and Dental Consonants*
Palatal versus Velar Narrow Vowels*
Narrow versus Wide Vowels*
Dental versus Labial Consonants*
Nasals versus Orals* *
Consonants versus Vowels*

clasned occur over time. The consonant-vowel distinction occurs first with a very specific distinction such as palatalized vs. nonpalatalized consonants occurring later.

This approach has received relatively little attention in the literature until recently (Ingram, 1974; Menyuk, 1969; Winnitz, 1969).

The distinctive features of English are usually defined as:

1. Vocalic/nonvocalic:

acoustically--presence (versus absence) of a sharply defined formant structure;

genetically--primary or only excitation at the glottis together with a free passage through the vocal tract.

2. Consonantal/nonconsonantal:

acoustically--low (versus high) total energy;

genetically-presence (versus absence) of an obstruction in the vocal tract.

3. Compact/diffuse:

acoustically-higher (versus lower) concentration of energy in a relatively narrow, central region of the spectrum, accompanied by an increase (versus decrease) of the total amount of energy and its spread in time;

genetically--forward-flanged (versus backward-flanged). The difference lies in the relation between the shape and volume of the resonance chamber in front of the narrowest stricture and behind this stricture. The resonator of the forward-flanged phonemes (wide vowels, and velar and palatal, including post-alveolar, consonants) has a shape of a horn, whereas the backward-flanged phonemes (narrow vowels, and labial and dental, including alveolar, consonants) have a cavity that approximates a Helmholtz resonator.

4. Grave/acute:

acoustically--concentration of energy in the lower (versus upper) frequencies of the spectrum;

genetically--peripheral (versus medial). Peripheral phonemes (velar and labial) have an ampler and less compartmented resonator than the corresponding medial phonemes (palatal and dental).

5. Flat/plain:

acoustically--flat phonemes are opposed to the corresponding plain ones by a downward shift or weakening of some of their upper frequency components;

genetically--the former (narrowed slit) phonemes, in contradistinction to the latter (wider slit) phonemes, are produced with a decreased back or front orifice of the mouth resonator, and concomitant velarization expanding the mouth resonator.

6. Nasal/oral (nasalized/nonnasalized):

acoustically--spreading the available energy over wider (versus narrower) frequency regions by a reduction in the intensity of certain (primarily the first) formants and introduction of additional (nasal) formants;

genetically--mouth resonator supplemented by the nose cavity versus the exclusion of the nasal resonator.

7. Tense/lax:

acoustically--more (versus less) sharply defined resonance regions in the spectrum, accompanied by an increase (versus decrease) of the total amount of energy and its spread in time;

genetically--greater (versus smaller) deformation of the vocal tract away from its rest position. The role of muscular strain, affecting the tongue, the walls of the vocal tract and the glottis, requires further investigation.

8. Interrupted/continuant:

acoustically--silence (at least in the frequency range above the vocal cord vibration) followed and/or preceded by a spread of energy over a wide frequency region (either as burst or as a rapid transition of vowel formants) (versus absence of abrupt transition between sound and "silence");

genetically--rapid turning on or off of source either through a rapid closure and/or opening of the vocal tract that distinguishes plosives from constrictives or through one or more taps that differentiate the discontinuous liquids like a flap or trill /r/ from continuant liquids like the lateral /l/.

9. Strident/mellow:

acoustically--higher intensity noise versus lower intensity noise;

genetically--rough-edged (versus smooth-edged). Supplementary obstruction creating edge effects (...) at the point of articulation distinguishes the production of the rough-edged phonemes from the less complex impediment in their smooth-edged counterparts (Jakobson and Halle, 1957, pp. 233-235).

SEMANTIC DEVELOPMENT

The topic of semantic development usually includes such topics as the age at which children produce their first meaningful word, how their words acquire their meaning, and the course of vocabulary development. Recently there has been a tremendous interest in the relationship of syntax and semantics.

Our information about semantic development in children is quite sparse, probably because we do not have a well developed semantic theory, and because semantics is like an iceberg with only a small tip available for direct observation.

Age of First Word

Darley and Winnitz (1961) have provided a review of 26 studies that reported age of first word. Generally, they reported that the average age of first word is about 11-12 months with a range of normal of approximately 8 to 18 months. There are a number of obvious problems with age of first word studies including; problems of definitions, faulty records and memory, and ulterior motives present in parental reports.

There seems to be considerable difference or variation of when parents report that their children say their first word probably because of the difficulty in defining the event. Some seem to define it as the first approximation to an adult word or an imitation, while others require that the child spontaneously and consistently use a word in conjunction with a specific object. Parents seem to feel considerable concern that their child say their first word "on time" and express relief that the event has occurred. Observation of this concern has given rise to the statement that, "The first word is probably in the mother's ear and not the child's mouth."

Most all of the studies of first word have focused on production and not comprehension. Since it is widely assumed that comprehension precedes production of words, it is reasonable to assume that comprehension of words is acquired before their production.

Vocabulary Development

After the onset of the first words there is evidence that there may be a period of as much as three to four months when children do not say many new words (Sterns, 1922). While during the period there may be little productive vocabulary development the size of the comprehension vocabulary is advancing at a fast pace (Rebelsky, Starr, & Luria, 1967).

A bibliography of many of the early vocabulary studies was compiled by Dale (1949). There was considerable early interest in the vocabularies of children (Bateman, 1914, 1915, 1916; Nice, 1915, 1917, 1920, 1926; Hull & Hull, 1919; Shirley, 1933; Smith, 1926; Van Alstyne, 1929; Williams, McFarland, & Little, 1937). McCarthy (1954) also reviews many of these early studies.

There have been few studies of vocabulary development within the past fifteen years and so we must rely on earlier work. Ammons and Ammons (1948) developed a vocabulary test and Ammons and Holmes (1949) reported normative data for two-, three-, four-, and five year old children. Templin (1957) used the Ammons test in her normative studies to assess receptive vocabulary. She used type-token ratio, a measure of vocabulary diversity, to measure expressive vocabulary. Her data revealed a fast rate of development on both measures throughout the preschool period.

Word Meaning

How words acquire their meaning has been argued for centuries without any real conclusion. For many words for which there is a clear referent it seems reasonable to suggest that through association of an object with its name, the name takes on the attributes of the object (Alston, 1964). This is not possible for words which do not have a referent or when it is difficult to specify the referent. Another problem with this approach is that most referents have more than one name (Brown, 1958). This referential or association theory of word meaning still seems to be the prevalent assumption.

Sometimes some of the child's early one-word utterances are referred to as holophrases (Brown & Bellugi, 1964). This means that the child in saying one word actually means a whole phrase. This notion has been criticized by Bloom (1973) although it seems to be widely accepted.

There are a number of recent studies that have dealt with specific word classes or categories: terms of cause and effect (Hargis, 1972); modifiers (Divesta, 1965); double function terms (Asch & Nerlove, 1960); number (Beilin & Kagan, 1969); time adverbs (Blackley, 1973); polar adjectives (Klatsky, 1973); adjectives (Cromer, 1970); seriation (Holowinsky, 1970); pronouns (Waryas, 1972); colors (Dale, 1969; Lenneberg, 1961); connectives (Katz & Brent, 1968); descriptive terms (Ervin-Tripp, 1973); kin terms (Haviland & Clark, 1974); and "more" and "less" (Donaldson & Balfour, 1968; Palermo, 1973).

Word Association

The procedure of having subjects associate words to investigate the quality of their lexicon has been used as a research device for some time (Brown & Berko, 1960; DiVesta, 1964; Entwisle, 1966; Entwisle & Forsyth, 1973; Ervin, 1961; Ervin-Tripp, 1973; Russell & Storms, 1955; Woodworth, 1938). It has been well established that the free associations given by young children differ from those of older children (Entwisle, 1966). Young children are more likely to emit a response which belongs to a different grammatical class than the stimulus word, for example, dog-bark, which is called a syntagmatic response, whereas older children are more likely to emit a response which is in the same grammatical form class as the stimulus, for example, dog-cat, which is called a paradigmatic response (Woodrow & Lowell, 1916; Entwisle, 1966). This syntagmatic-paradigmatic shift occurs in normal children somewhere between CA five and seven years.

A number of explanations have been suggested to account for this syntagmatic-paradigmatic shift (Brown & Berko, 1960; Ervin, 1961; McNeill, 1966). None of these explanations is fully supported by the available evidence (Routh & Tweney, 1972). Word association tasks continue to hold great interest to researchers and clinicians despite this lack of an absolute explanation of the process (Anglin, 1970). Word association and free recall behavior in children (Anderson & Beh, 1968) are closely related to other verbal behaviors such as verbal mediation (Kendler & Kendler, 1962) and verbal control of behavior (Luria, 1961; Wozniak, 1972). Most of these verbal behaviors show significant changes in children between CA five to seven years.

SYNTACTIC AND MORPHOLOGICAL DEVELOPMENT

Many of the early studies have been reviewed by McCarthy (1954). Templin (1957) conducted the last of the large normative studies. These early studies emphasized the importance of arriving at some average age for the important milestones of language development. Usually 50 or 100 utterance samples we elicited from large groups of children of various ages and then specific counts or classifications were made of the utterance. General conclusions such as mean length, type, or complexity of utterances at various ages were derived. These data have provided specialists with a gross index of language development but tended to ignore the fact that language development is a dynamic, continuously changing process.

Much of the research of the late 50's began to emphasize what the child's knowledge of language was rather than a description of the surface form. Researchers (Berko, 1958; Berko & Brown, 1960; Brown, 1957) start to attempt to test the child's productive system and how he is able to generate new sentences and structures.

There are a number of early reviews of this period of research (Berko & Brown, 1960; Carroll, 1960; Ervin-Tripp, 1966; Ervin & Miller, 1963; Rebelsky, Starr & Luria, 1967, Winitz, 1966). These reviewers concluded that children do not learn individually all the possible words, forms, or sentences of English but that they learn an underlying value system that allows them to produce novel yet appropriate utterances. Much of this literature contains the classic descriptions of such notions as pivot grammar, telegraphic speech, and the development of inflections.

While the research of the 60's emphasized descriptions to the form of children's early sentences the research of the 70's has emphasized the function of language and an explanation of the child's utterances (Beuer, 1970; Bloom, 1970, 1973; Bowerman, 1973; Gleitman, Gleitman, & Shipley, 1973; Sinclair, 1970; Slobin, 1971). Recently there has also been a tremendous interest in the role that adults play in the language acquisition of children (Broen, 1972; Giattino & Hogan, 1974; Holzman, 1974; Killian, 1974; Longhurst & Stepanich, 1975; Longhurst, Reichle, & Stepanich, 1974; Moerk, 1972, 1974; Phillips, 1973; Ringler, Kennell, Jarvella, Navojosky, & Klaws, 1975; Ruke-Dravina, 1974).

Telegraphic Speech

A number of authors (Bloom, 1970; Braine, 1963; Brown & Bellugi, 1964; Brown & Fraser, 1963; Miller & Ervin, 1964) have characterized the speech of young children from about CA 2 to 3½ as "telegraphic" in nature. These children leave out of their speech the same kind of words as are deleted by adults from messages to be telegraphed. Words that carry relatively little meaning such as pronouns, prepositions, articles, conjunctions and auxiliary verbs are usually deleted from telegrams. The child's speed at this time, just like the adults' telegram, is made up primarily of nouns and verbs (with an occasional adjective or adverb). Just as the adult operates with a monetary constraint on length the child also operates with some kind of constraint on length. It is assumed this constraint is not due to limited memory or vocabulary but represents an inability to plan a program a longer utterance (Brown & Bellugi, 1964).

Brown and Fraser (1963) asked six children between CA 2 and 3 to imitate 13 simple English sentences. These subjects tended to leave out articles, prepositions, the copular be, and auxiliary verbs. These are referred to as function words or functors. They also omitted inflections such as past tense and plural markers. They retained the nouns, verbs, adjectives, and pronouns in essentially the same word order as the stimulus sentence. These are the content words, or contentives. They also reported this characterization was true of the children's spontaneous speech. The subjects' mean-length-of-utterance was similar for both imitated and spontaneous sentences.

Brown and Bellugi's (1964) description of the speech two children confirmed the "telegraphic" notion of young children's speech. This telegraphic speech can be understood by adults and thus it is a functional communication system for the child.

Brown (1973) suggests that functors are added to the speech of young children over time so that the percentage of obligatory functors missing decreases. He reported that for 11 obligatory contexts percentages of functors missing were 97, 87, and 84 for Adam, Eve, and Sarah respectively at Stage I and 26, 33, and 21 for the same children at Stage V.

Pivot Grammar

Brown (1973) recently provided an excellent review of the literature concerned with pivot grammar. The assumption of pivot grammar simply stated is that the child's first multi-word utterances can be described by a simple but highly systematic role system. A small group of words that occur frequently in children's speech occur in ordered relation to a much larger group of other words in these utterances. Frequently, occurring words such as "more", "see" and "all gone" usually occur in the first position while less frequently occuring words such as "boat", "shoe", and "milk" occur in the second position. The small, closed group of words that are frequently occurring are called "pivots" while the remaining words in the child's vocabulary are called "x-words" or "open-words". The "open" class of words tend to be large in relation to the pivot class and is growing steadily.

The pivot grammar notion of the child's early multi-word combinations was supported by a number of investigators (Braine, 1963; Brown & Bellugi, 1964; Brown & Fraser, 1963; McNeill, 1966, 1970; Miller & Ervin, 1964). Pivot grammar is a classic assumption of developmental psycholinguistics although it has received considerable criticism recently (Bloom, 1968, 1970, 1971; Bowerman, 1973; Brown, 1973; Schlesinger, 1971).

One criticism of pivot grammar was that the pivot and open classes of words did not really have counterparts in the adult grammar of English (Bloom, 1970, 1975). Pivot grammar ignored the meaning of the child's utterances almost completely (Bloom, 1970; Schlesinger, 1971). Bowerman (1973) and Brown (1973) have pointed out that contrary to earlier belief, that pivot word can occur in first or second position and that pivot words can occur alone. In a sense the major criticism of the early pivot grammar notion was that it did not credit the child with the functional communication system that pivot grammar seems to be. With this simple grammar the young child is able to describe the world in which he lives and make demands quite effectively. Bloom (1970) suggested he can effectively denote semantic relations such as nomination, recurrence, disappearance, existence, possession, location, rejection, demonstration and denial. So pivot grammar is still a viable notion as long as it is modified to include this new appreciation of the semantic aspects.

Later Syntactic and Morphological Development

The study of language acquisition after pivot grammar or early stages of development is much less developed. The data are much more fragmentary and there is not a well defined grammar that could be used to tie our present knowledge together. Brown, Cazden, and Bellugi (1969) and Gruber (1967) have proposed tentative partial grammars to cover this time period but since the data on this later development are quite fragmentary we will review the available literature under such topics as negation, questions, and grammatical morphemes.

Negation. Much of the investigation of the development of negation markers in the speech of children was done by Bellugi (1967) and Klima and Bellugi (1966). They described the development of negation in three children and suggested that there were three successive stages of development in which the syntactic forms used to mark negative change. In the first stage the children simply attached a negative marker before or after the utterances such as "no milk" or "go out no". In the second stage the negative marker was included within the utterance such as "me no go" or even the contracted for "I no want go". In the third stage the childrens' utterances approximated those of adults. Bloom (1970) emphasized the semantic aspects of analyzing childrens' speech and this is especially important in the area of negation. She reported children often use "no" alone to indicate rejection but they also use it alone or in conjunction with other words to indicate disappearance, nonexistence, nonoccurrence, or denial.

Questions. Certainly the first form of question-asking is rising intonation at the end of an utterance with associated gestural or contextual cues. Brown (1968) has described the only development of the use of wh- words such as who, what, and when. Some of the earliest forms consisted of a wh- word and a present progressive verb such as "What doing?" a "Who walking" or questions like "What that?" or "Where Sue go?" The next development usually included preposing the wh- word which resulted in utterances like "What Sue will do?" or "Why Sue play truck?". The next development was transposing the subject and verbal auxiliary to produce sentences like "What will Sue do?" or "Why is Sue crying?". Ervin-Tripp (1970) reported the five 25 month old children comprehended the different wh- words to varying degrees. "Where", "what", and "who" were easier than "why", "how", and "when". Brown and Hanlon (1970) reported the development of trancated and tag questions. Trancated questions such as "Did he play ball?" were produced before tag questions like "We played good, right?".

Grammatical Morphemes. Brown (1973) was provided an extensive description of what he calls grammatical morphenes; prepositions, articles, copula, auxiliary verbs, and noun and verb inflections. He compared his data with other investigators (Brown & Fraser, 1963; Cazden, 1968; deVilliers & deVilliers, 1970; Menyak, 1963, 1964; Miller & Ervin, 1964) and found a tremendous degree of consistency. He concluded that the 14 grammatical morphemes he scored developed in essentially the same order in his three subjects but that the rate of development varied considerably. Figure 1:3 shows the order of acquisition and ages for Brown; three subjects for the 14 grammatical morphemes. Berko (1958) classic study of morphological skills in kindergarten and first grade children is also relevant although it differs considerably from Brown's work. Interestingly enough, Berko's subjects did not perform as well as Brown's younger subjects. The tasks in the two investigations were considerably different since Brown's analysis was of spontaneous speech while Berko's was a test-like situation in which the examiner supplied the stimulus sentence and a picture and the child simply had to close the sentences with a word with the appropriate inflection.

Figure 1:3. The order of acquisition of 14 grammatical morphemes in three children

Source: Brown, R. A first language. Cambridge: Harvard University Press, 1973.

Adam		Sarah		Eve	
I (2;3)		I (2;3)		I (1;6)	
II (2;6)	Present progressive *in* *on*, plural	II (2;10)	Plural *in*, *on* Present progressive, past irregular Possessive	II (1;9)	Present progressive, *on*
III (2;11)	Uncontractible copula, past irregular	III (3;1)	Uncontractible copula Articles	III (1;11)	*in* Plural, possessive
IV (3;2)	Articles Third person irregular, possessive	IV (3;8)	Third person regular	IV (2;2)	Past regular
V (3;6)	Third person regular Past regular Uncontractible auxiliary Contractible copula Contractible auxiliary	V (4;0)	Past regular Uncontractible auxiliary Contractible copula Third person irregular Contractible auxiliary	V (2;3)	Uncontractible copula Past irregular Articles Third person regular Third person irregular Uncontractible auxiliary Contractible copula Contractible auxiliary

Berko's data showed generally that first graders had mastered most of the regular inflections of English.

Syntactic and Morphological Development in School-Age Children

Recent authors have generally suggested language development is essentially over by 5½ years of age in most children (Lenneberg, 1967; McNeill, 1970). Increasing it is being recognized that there is still significant development that takes place during the elementary school years (Palermo & Molfese, 1971).

Menyuk (1963, 1964) has described the spontaneous speech of children in the early grades. Loban (1966) collected speech samples of children from kindergarten through the ninth grade. He described both syntactic and will as vocabulary changes that occurred during this period. O'Donnell, Griffin, and Norris (1967) collected speech samples from children between CA 5 to 14 years. They reported significant changes over time for both length and complexity of sentences. C. Chomsky's (1969) investigation is one of the most extensive that deals with school-age children.

COMMUNICATION DEVELOPMENT

Only a few methods have been developed to study communication development in young children and our knowledge is limited. The task is usually defined as a communication situation involving a speaker and a listener who can hear, but not see each other. Both participants have an array of objects or pictures. In the Krauss and Glucksberg (1969) "stack the blocks" game, the listener has a set of four blocks, each of which has an abstract design imprinted on it. The speaker, on the other side of a screen, takes a single block from a dispenser and has to describe it in such a way that his partner can stack the corresponding block on a peg. Communication is measured in terms of how accurately the listener selects the appropriate blocks from the array, based on the speaker's descriptions. In general, the data indicate that the children become more adept on the task with age, and that they are generally better as listeners than as speakers in this communication game (Glucksberg, Krauss and Higgins, 1975). Hanson (1972) used much the same technique with young children, except that he substituted familiar objects for the nonsense designs used by Krauss and Glucksberg (1969).

There are a number of variants of this basic procedure, many of which are described in Glucksberg, Krauss, and Higgins (1975), Rosenberg and Cohen (1967) and Rosenberg (1972). In all of the variations of the basic procedure, the approach is limited to only one aspect of communicative behavior -- the effective transmission of referential information that will allow for the identification of a stimulus within some array. Communication in its broadest sense clearly involves more than reference, but this aspect has been studied most extensively.

Flavell and his colleagues (1968) also devised a series of communication tasks, to test the development of "role-taking skills" in children. These studies are closely allied to Piaget's concepts of egocentrism and role-taking ability. The tasks are generally very inventive and not nearly so standardized as those used by Rosenberg or Krauss and Glucksberg. The basic strategy is to devise a communication situation in which the listener has some peculiar characteristic that has to be noted by the speaker if adequate communication is to ensue. For example, the listener may be wearing a blindfold, or placed at a peculiar vantage point in the situation, or may be fully familiar vs. unfamiliar with the situation, etc.

The procedures in the role-taking and communication studies have almost exclusively focused on the child's sensitivity to his listener's needs. Another important aspect of communication is the child's ability to use language to serve his own needs. This seems to have been studied much less extensively.

Chapter 2. SPONTANEOUS LANGUAGE ACQUISITION IN HANDICAPPED PRESCHOOL CHILDREN

There have been a number of reviews of language in handicapped children (Bangs, 1968; Benton, 1966; Berry, 1969; Brown, Darley & Gomez, 1967; Darley, 1964; Hardy, 1965; Ingram, 1959; Irwin & Marge, 1972; Kastein & Flower, 1954; Morley, 1965; Myklebust, 1952; Peacher, 1949; Rapin, 1959; Wood, 1964; Wyatt, 1968).

There is considerable controversy in terminology and classification. As anyone who works with language in handicapped children knows, a single child may be given different diagnostic labels by different examiners.

For the purposes of the current review of the literature childhood language disorders have been categorized into four major areas: Acoustic Disorders, Neurological Disorders, Emotional Disorders, and Mental Retardation. Obviously even these major classifications overlap and a given child may evidence behavior that could cause him to be classified in all of these categories. The quantity and quality of literature available in each of these areas is grossly different. There is considerable literature relating to language in mentally retarded children while there is relatively little on the spontaneous oral language acquisition of preschool acoustically, emotionally, or neurologically handicapped children.

SPEECH AND LANGUAGE IN ACOUSTICALLY HANDICAPPED CHILDREN

The term acoustically handicapped refers both to the child with a profound hearing loss and to the child with a relatively mild hearing loss. The term deaf is usually reserved for the child whose hearing loss is approximately 75 decibels or greater and who is incapable of learning language through the normal auditory channel. The child with a mild loss will usually adequately develop morphological and syntactic language skills in an essentially normal fashion but may have some difficulty with sound mastery. Although there are considerably more children with mild to moderate losses, there is very little research available on their speech and language problems. Most of the research deals with the speech and language of deaf children.

Comparison of Deaf and Hearing Children at Age 5

As we concluded in Chapter 1, the normally hearing 5-year-old child is linguistically proficient. He seldom makes errors. He can produce an infinite number of sentences that are relatively correct and appropriate. He is able to successfully use his language to manipulate his environment and to gain new knowledge. Of course he still has some things to learn especially in the area of communicating, but for most purposes acquisition is essentially complete. And further, this knowledge has been acquired naturally through little conscious effort by adults around him. This linguistic knowledge provides an excellent foundation for this child to enter school and acquire reading and writing skills with relative ease.

When this normally hearing 5-year-old child is compared with the 5-year-old deaf child the tremendous impoverishment in language is immediately apparent. Without intensive training this child may lack language performance completely and he may not even be aware that sounds exist let alone that there are such things as words. Even early school-age deaf children may have only a few words in their expressive vocabularies that are intelligible only to their families. Their speech reading ability may be limited to a few common expressions. There is little or no foundation for later reading and writing skill development and even most deaf adults who have received intensive training do not achieve reading and writing skills above the fifth grade level. In contrast to the normally hearing, even this limited linguistic knowledge gained by deaf persons is not acquired naturally but is the result of thousands of hours of specific training.

Writing, Reading, and Cognitive Development

Most of the language research with the deaf either relates to writing (Cohen, 1964; Fusfeld, 1955; Heider & Heider, 1940; MacGinitie, 1964; Myklebust, 1960; Simmons, 1959, 1962; Templin, 1950; Thompson, 1956; Wells, 1942) or reading (Goetzinger & Rousey, 1959; Magner, 1964; Myklebust, 1960, 1964; Pintner & Paterson, 1916; Pugh, 1946; Reamer, 1921; Wrightstone, Aronow & Moskowitz, 1963). Reviews in these areas have been done by Cooper and Rosenstein (1966), Quigley (1966) and Moores (1972).

There has also been a heavy interest in the cognitive abilities of the deaf. Several authors (Bonvillian, Charrow & Nelson, 1963; Furth, 1964; Mindel & Vernon, 1971; Vernon, 1967) have provided reviews in this area.

Speech and Language Development

There is very little literature on the development of spontaneous oral language development in preschool deaf children. This is probably due to two major factors. The first is that most deaf children do not acquire much spontaneous oral language until school age or after. Secondly, if any oral language is acquired it is so unintelligible as to defy transcription and analysis.

The one exception to the lack of literature on the natural or spontaneous acquisition of language in deaf children related to deaf children of deaf parents.

Deaf Children in Deaf Families

Because sometimes deafness appears to be genetically transmitted, there are families in which one or both parents and their child is deaf. Rainer, Altshuler and Kallmann (1963) in a study of incidence of deafness in New York State reported that 10 percent of children born to deaf parents are also deaf. There are two important factors which make the developmental experiences of the deaf child of deaf parents and the deaf child of hearing parents grossly different. First the adjustment of deaf parents to a deaf child should be less traumatic. The shock and subsequent emotional adjustment problems should not be as severe. More importantly, the deaf child and his deaf parents have a means of communication available almost from birth, since most deaf adults utilize a manual sign communication system (even though they were probably denied this system early in life). There is increasing acceptance of the sign system of the deaf as a bona fide language (Schlesinger, 1970). The use of this sign system by the deaf child to communicate should also improve his social and emotional adjustment.

The available results on the adjustment of deaf families is somewhat equivocal. Brill (1960) compared the emotional adjustment of 45 deaf children of deaf parents to that of 45 children who had hearing parents but deaf siblings and 45 children with no deaf relatives. The children in all groups were equated on sex, age, and IQ score. There were no significant differences among the three groups as a whole but when boys were compared separately, there were significant differences in favor of children of deaf parents demonstrating better emotional adjustment. However Brill concluded that a subjective analysis of the deaf families revealed very definite evidence of maladjustment. Stuckless and Birch (1966) compared 38 deaf children of deaf parents with 38 deaf children of hearing parents using a matched-pair design. The subjects were matched on sex, age, age of admittance to school, severity of hearing loss and IQ score. The authors reported no significant differences between the two groups for psychosocial adjustment on rating scales completed by teachers. Meadow (1968) compared 59 deaf children of deaf parents with 59 deaf children of hearing parents. The subjects were matched on age, sex, IQ score, hearing impairment, family size and father's occupational status. She reported that deaf children of deaf parents ranked higher on self image tests and showed higher ratings by their teachers and counselors on maturity, responsibility, independence, sociability, popularity, approximate sex-role and approximate response to situations. They also showed an absence of communication frustration and a willingness to communicate with strangers.

Although there are some equivocal results between these two groups on speech, language and academic achievement, the results most often favor the deaf child of deaf parents. Quigley and Frisina (1961) studied 16 deaf children of deaf parents in comparison to a population of 120 deaf day school children. They reported those 16 children were higher in fingerspelling and vocabulary but with no difference in educational achievement or speechreading. The deaf children of hearing parents had better speech. Stevenson (1964) matched the records of all 134 deaf children of deaf parents at the California School for the Deaf at Berkeley between 1914 and 1961 with the records of 134 deaf children of hearing parents. He reported that 38 percent of children with deaf parents ultimately went to college compared with 9 percent of those with hearing parents. Only 14 of the 134 children of deaf parents were weaker academically than the children of hearing parents and 90 percent possessed a very strong command of the language. Stuckless and Birch (1966) reported significantly higher reading scores, speechreading scores and written language scores for deaf children of deaf parents. They reported no significant differences between the groups on speech intelligibility scores. Meadow (1968) reported that children of deaf parents ranked higher in general academic achievement and were superior to deaf children of hearing parents in arithmetic, reading, written language, fingerspelling and use of signs. No differences between the two groups were reported for speech or speech reading ability.

These differences in favor of the deaf child of deaf parents are even more significant when viewed in relation to the documented evidence of the socio-economic and academic advantages of deaf children in hearing families. The socio-economic status of children with hearing parents is generally higher. The language and speech of deaf parents to which the deaf children are exposed is limited in comparison to that of hearing parents. The deaf children of hearing parents are more likely to receive preschool training and individual tutoring (Meadow, 1968). As Moores (1972) suggests, we can only speculate on the attainments of deaf children of hearing parents if they had been exposed to early systematic communication with their parents. Until recently relatively few hearing parents of deaf children used a manual sign communication system. Statements by professionals such as that by Dicarlo (1964, p. 115) that, "...the evidence is impressive that speech seldom develops if signs come first." tended to discourage the use of signs with young deaf children.

Phonological Development

The deaf are deficient in rhythm, articulation, and general intelligibility (Goda, 1957; Hudgins & Numbers, 1942; Hughson, Ciocco, Witting & Lawrence, 1942; Morley, 1949).

Vocabulary and Semantic Development

Studies of the characteristics of the spoken vocabulary of the school-age deaf (Goda, 1964; MacGinitie, 1964; Myklebust, 1964; Simmons, 1962) have reported that the deaf are deficient in certain word classes. These investigators report their output consists mainly of nouns and verbs and they are deficient in adjectives, adverbs, and function words. They use only a small number of different expanding words such as auxiliaries and connectives.

Brannon (1968) classified the words spoken by three groups of children; 30 normally hearing children with a mean CA of 12.6 years, 15 hard-of-hearing children and 15 deaf children with a mean CA of 12.6 years, into 14 word classes according to a system developed by Jones, Goodman, and Wepman (1963). Group-means for each classification of words were compared. The total number of words (tokens) and the total number of different words (types) were analyzed. Brannon concluded that a significant hearing impairment reduce productivity in both tokens and types. A moderate hearing impairment lowered the use of adverbe, pronouns, and auxiliaries; a profound impairment reduced nearly all classes. In proportion to their total word output the deaf group overused nouns and articles while underusing prepositions, quantifiers, and indefinites.

Several investigators (Jacobson, 1968; Kline, 1945; Koplin, Odom, Blauton and Nunnally, 1967; Nunnally & Blauton, 1966) have attempted to examine word associations in deaf children. The results of these studies are quite inconclusive. Kline (1945) reported that the same age trends were evident in deaf subjects' word associations as were observed in hearing children's word associations. Jacobson (1968) however reported that the number of more developed paradigmatic word association responses by deaf children actually declined with CA for most parts of speech. Koplin et al. (1967) presented spoken and signed word association stimuli to deaf children in a written free association task. They reported that the free associations of deaf children resembled those of younger hearing children in numbers of superordinates and contrasts and in commonality. They also reported that paradigmatic responses to nouns, however, were more frequent in deaf than in hearing subjects.

Since most deaf children are only semilliterate in English (Furth, 1973), it seems only natural that word association tasks employing English words as stimuli and usually requiring written responses have yielded equivocal results. Most deaf children learn to communicate by manual methods before they acquire much proficiency in English. If word association tasks are to be used to assess the lexicon of deaf children it seems reasonable that the stimuli should be presented to them in the language medium with which they are most familiar.

Tweney and Hoeman (1973) investigated the word associations of 46 deaf children between CA 9 and 13 years compared with 30 normal learning children with the same CA 7 to 13 years. All stimulus items were presented to the deaf subjects using spoken English, finger spelled English, and American Sign Language gesture symbols. The deaf subjects responded with their word associations in spoken or fingerspelled English or a signed gesture, as they preferred. Word associations for the same stimulus list were obtained from the hearing subject using traditional oral procedures. Both groups showed a syntagmatic-paradigmatic shift. The level of paradigmatic responding was lower for deaf children, however, suggesting quantitative but not qualitative differences. Tweney and Hoeman's results provide clear evidence for a syntagmatic-paradigmatic shift in deaf children's American Sign Language lexical items, in contrast to previous reports using English lexical items.

Morphological and Syntactic Development

Brannon and Murry (1966) collected 50-sentence spoken language samples from 30 deaf and hearing impaired children with a CA range of 8.7 to 18.5

years and from 30 normally hearing children with an CA range of 12.0 to 13.5 years. The samples were quantified according to total output and syntactical accuracy. A total score of structural accuracy was obtained by combining the errors of addition, omission, substitution, and word order. The hard-of-hearing subgroup resembled the control group of normal children in total output of words, but the deaf group has significantly lower word output. For syntax measures, all three groups differed significantly. The deaf and hearing impaired subgroups were significantly below the normal hearing group on average words per sentence, total errors, words per corrected sentence, and total syntax score.

Schmitt (1968) investigated deaf childrens comprehension and production of the passive voice using a multiple-choice test which involved matching reversible passive sentences to pictures. He reported that deaf children had considerable difficulty comprehending and producing passive sentences up to a CA of 14 years. Turner and Rommecveit (1967) reported that normal hearing children at CA 8-9 used passives appropriately. Even many of Schmitt's CA 17 years subjects still had not mastered the passive construction. He suggested that until advanced age deaf children possess passive sentences as if they were active.

Tervoort (1970) reported essentially the same results as Schmitt for Dutch deaf children. Dutch and English passive structures are similar. Tervoort suggested that deaf children seem to process passive sentences in terms of what he called the surface subject-verb-object strategy. The deep structure implications of passive markers, was, -ed, and by were not understood by deaf children until late adolescense.

Power and Quigley (1973) tested 50 deaf children between the CA's of

9 and 18 years for their comprehension of the passive voice. The comprehension tests consisted of moving toys to demonstrate the action of a sentence, or selecting a picture showing the action of the sentence. The production task required the subjects to fill the gap in a sentence with the correct set of passive markers. Significant improvement with age took place on all the tasks. Even at CA 17-18 years only slightly more than half of the subjects correctly understood passive sentences and less than half correctly produced passive sentences. Power and Quigley's subjects scored lowest on agent-deleted passive sentences, somewhat higher on reversible passives, and highest on non-reversible passives. By was the only passive marker used consistently by deaf children.

Pressnell (1973) administered Lee's (1969, 1970) Northwestern Syntax Screening Test (NSST) and Lee and Cantor's (1971) Developmental Sentence Scoring (DSS) procedure to 47 severely hearing impaired and deaf children between the CA's of five and 13.3 years. These subjects' scores were compared to Lee's (1969) and Lee and Cantor's (1971) normative data. The NSST consists of a receptive portion and an expressive portion, each of which is made up of 20 sentence-pair that are presented orally to the child along with appropriate pictures (See Chapter 3). The DSS requires the elicitation of 50 spontaneous sentences from the subjects and then these sentences are analyzed in specific ways (See Chapter 3). Results on the NSST indicated that for both reception and expression, older hearing impaired children perhaps somewhat better than younger but their scores were significantly below that of normally hearing subjects and the rate of acquisition was much faster in normally hearing subjects. Application of the DSS procedure showed that the hearing impaired subjects' production of grammatical features did not increase significantly with Lee and Cantor's (1971) normative data. Pressneli reported some difference in the sequential order of particular verb constructions however these were attributable to the order in which the constructions were taught in the children's classroom.

Cooper (1967) administered a Berko-type test in 140 deaf subjects between the CA's of 7 and 19 years and 176 normally hearing subjects between the CA's of 7 and 18 years. The performance of the normally hearing subjects was superior to that of the deaf subjects. Also the patterns of item difficulty were similar for both groups.

SPEECH AND LANGUAGE IN NEUROLOGICALLY HANDICAPPED CHILDREN

Our discussion will include a brief description of the speech and language of children with minimal brain damage, children with oral apraxia, and children with aphasia. We have specifically excluded a description of children with cerebral palsey because except for their orthopedic difficulties, their speech and language difficulties can be included in our descriptions of aphasia, apraxia or mental retardation. These classifications serve more of an editorial function than an actual occurance. In fact, a child usually exhibits mixed symptoms that may cause him to be classified into more than one of these categories.

Chase, (1972) and Eisenson (1972) have provided excellent descriptions of developmental neuroanatomy and neurophysiology as well as neuropathology and these areas are beyond the scope of the present review.

Minimal Brain Damage

Over the last several years and to some extent the previous two decades, there has been an increasing amount of literature describing the speech and language acquisition of children with minimal brain damage or minimal cerebral dysfunction. These children are usually labeled learning disabled when they begin to fail in school. The diagnosis is usually made on the basis of what are termed "soft" neurological signs including short attention span, hyperactivity, speech and language delay, and perceptual and memory deficits (Clements & Peters, 1962; Cohn, 1964, Gofman, 1964). These children also sometimes have problems with fine motor coordination and general clumsiness (Gubbay, Ellis, Walton & Court, 1965).

These children often present problems with auditory discrimination and perception with associated speech and language impairment (Ingram, 1959, 1960, 1965; Ingram & Reid, 1956; Morley, 1965).

The few descriptions we have of the speech and language of children with minimal brain dysfunctions deal almost entirely with writing and reading or oral language in older school-age children.

Oral Apraxia

Children with oral apraxia usually exhibit good to excellent comprehension of speech but severe difficulties with production (Eisenson, 1972). The developmental history of the apractic child will usually reveal relatively normal receptive language development. The parents probably did not even become concerned until several months after the normal age of first words. Auditory acuity and auditory perception and discrimination are usually found to be within normal limits. The child will have severe difficulty executing any specific movements with his articulators. This is true not just for speech but in chewing and drinking. The child usually vocalizes but his speech may be almost completely unintelligible.

Aphasia

Aphasia is usually defined as a loss of language due to brain damage.

The term is somewhat inappropriate for the child who sustained brain damage before or during the birth process before any language was acquired (Eisenson, 1972; Kleffner, 1973; Lenneberg, 1964). Eisenson and Ogilvie (1971) suggested the term dyslogia, however, the term aphasia is still popularly used to describe children with essentially normal nonverbal acquisition but with apparent early brain damage who experience difficulty learning language. Sometimes the term dysphasia, meaning a decrease in language rather than complete loss, is used (Weiner, 1972).

Aphasia in children is usually subcategorized into three types: congenital aphasia, developmental aphasia, and acquired aphasia.

Congenital Aphasia

Congenital aphasia is indicated if the child displays signs of brain damage with associated speech and language deficiency with no family history of similar language disorder. Also deafness, mental retardation and severe emotional disturbance should be ruled out. One prevalent diagnostic indicator of the congenitally aphasic child is the apparent inability to process auditory input (Benton, 1964, 1966; Gordon, 1966; Myklebust, 1952; Reichstein & Rosenstein, 1964). In fact congenitally aphasic children are frequently misdiagnosed as deaf because they show little attention to or interest in sound. Many authors have suggested that congenitally aphasic children have incurred damage to the central auditory system (Benton, 1964; Ewing, 1967; Gordon, 1966; Landau, Goldstein & Kleffner, 1960). With this severe auditory deficit phonological development will be impaired and development of morphological and syntactic structures are significantly disordered. Syntax may develop to the stage of telegraphic speech but there is usually little development beyond into articles, prepositions, auxillary verbs, and conjunctions (Ingram, 1959, 1960; Ingram & Reid, 1956).

Developmental Aphasia

Developmental aphasia is usually described as a subtype of congenital aphasia (Chase, 1972). Generally the pattern of speech and language disorder is less severe and the overall prognosis for language acquisition is much better. The major defining characteristic of developmental over congenital aphasia is that with developmental aphasia there is a history of other family members with similar problems (Ingram, 1960). These children often present auditory perceptual dysfunctions and speech sound discrimination and phonemic sequencing difficulties (Eisenson, 1972). They are especially distractable which may account in part for theie difficulty in acquiring speech and language skills. The speech and language facility of the developmentally aphasic child may vary greatly. Some at CA five may be essentially nonverbal both in the production and comprehension of speech. Some at CA five may only experience some mild articulation difficulties, somewhat limited vocabulary, and some morphological and syntactic problems.

Acquired Aphasia

Acquired aphasia in children is usually the result of brain lesions in automobile accidents or other lesions in the same areas that produce aphasia in adults. The affect of speech and language is not the same as in adults however (Benton, 1964, 1966; Lenneberg 1964, 1967). Generally the child with acquired aphasia will talk very little sometimes becoming mute (Guttman, 1942). If speech is produced it is often telegraphic type speech. Children recover their language function much faster than adult aphasics (Guttman, 1942; Lenneberg, 1964, 1967).

SPEECH AND LANGUAGE IN EMOTIONALLY HANDICAPPED CHILDREN

It is possible to observe signs of severe emotional disturbance very early in childhood. Characteristics which are sometimes observed include: the presence of echolalia and little use of meaningful or appropriate speech even though the child seems to have normal intelligence, preference for interaction with physical objects or toys rather than persons, stereotyped routines, and avoidance of eye contact or physical interaction with other persons (Chess, 1959: Eisenberg, 1957; Kanner, 1944; Schain & Yannet, 1960). Children who display one or more of these behaviors to excess are usually refered to as psychotic, autistic, or schizophrenic. There seems to be little agreement in classification with many professionals using these terms interchangeably. The cause of severe emotional disorders in children is also a controversial issue at present. Some claim the etiology to be abberant parent-child relationships while others suggest brain damage (Baer, 1961; Eaton & Menolascino, 1967; Reiser, 1963; Rutler, 1965). This report will not attempt to resolve these controversies. We will attempt to review studies that deal with the communication development of moderately and severely emotionally disturbed children.

Early Nonverbal Communication Development

A number of authors have emphasized the importance of nonverbal communication early in life (DeCarlo, 1968; Des Lauriers & Carlson, 1969). Nonverbal communication with significant adults seems to serve as a prerequisite step to later development of speech and language. There is good evidence that severely emotionally disturbed infants do not experience this nonverbal communication. Kanner (1956) described the hesitancy of parents of autistic children to interact physically with their young child. The parents seemed to feel little need to communicate with their children. Autistic children, by definition, avoid interpersonal contact and therefore there is little need for communication. Weiland and Legg (1964) and de Hirsch (1967) suggest that shared social experiences which are so important to normal children seem to have much less importance to autistic children. Therefore both sides, parent and child, of the communication dyad fail to initiate or encourage communication.

Late Nonverbal Communication Development

Wolf and Ruttenberg (1967) reported that older autistic children sometimes attempt communication but only through nonverbal means. Ruesch (1959) also reported that severely emotionally disturbed children express themselves through nonverbal means such as body movement. Spiegel (1959) noted that there were characteristic or stereotyped patterns of posture, stance, movement, muscle tension, and facial expression which communicated a wide range of emotions. Ruttenberg and Gordon (1967) have analyzed the nonverbal communication patterns of autistic children into 10 nonverbal levels that represent sequential growth. These levels represent changes in the nature and degree of communicative relationship with an adult.

Speech and Language Development

The speech and language development of the severely emotionally disturbed child can range from a complete lack of speech to an inconsistent use of speech for communication (Lenneberg, 1964; Shervanian, 1967).

There is very little literature that describes specifically the speech and language development of the severely emotionally disturbed child. What literature there is will be described within the three levels of language development and communication development.

Phonological Development

The articulation of autistic children is usually deficient (Chase, 1972).

Goldfarb, Braunstein and Lorge (1956) noted that the speech of autistic children lacks intonation or inflection. Pronovost (1966) also described the speech of autistic children as monitonal with a high pitch and also included hoarseness, harshness and hypernasality. Emotionally handicapped children also usually display an impairment in speech perception and discrimination. There are probably a number of factors that contribute to there difficiencies. Their sparse use of any spoken language is probably a significant factor. Severely emotionally disturbed children also often demonstrate motor disabilities which may influence their motor control for articulation.

Vocabulary Development

Pronovost (1966) reported that the vocabulary of most autistic children is limited to the level of concrete nouns, similar to that of a nonhandicapped 2-year-old, with an absense of abstract and collective nouns. Weiland and Legg (1964) noted an unusually high proportion of nouns, pronouns, and prepositions in the speech of psychotic children. Benton (1966) described the vocabulary of psychotic children as a "word salad" made up of word substitutions, poor associations, and neolgisms (made-up words). Ellsworth, (1952) noted a decreased use of verbs in the speech of emotionally disturbed children. DeHirsch (1967) suggested that words lose their symbolic stature and they become concrete entities of and by themselves. A number of investigators (Arieti, 1955; Benton, 1966; Bleuler, 1955; Sommer, Dewar & Osmond, 1960) have commented on the unusual and bizarre word associations of emotionally disturbed children.

Morphological and Syntactic Development

There are no specific descriptions of the morphological or syntactic development of emotionally disturbed children. Kanner (1946) noted that some of the autistic children he studied used sentences on occasions when they were distressed or in emergency situations. The prevalence of echolalia in the speech of severely emotionally handicapped children is well documented (Fay, 1969). These children have an unusual ability to immediately repeat phrases or sentences they hear and to repeat sentences from earlier conversations or from television or radio (Fay, 1966, 1967, 1969; Kanner, 1946). The uninitiated sometimes interpret this as evidence of their morphological or syntactic ability.

Communication Development

Lack of appropriate interpersonal communication is a defining characteristic of severely emotionally handicapped children. Stereotyped patterns of nonverbal communication and echolalia appear to substitute for appropriate communication. Goldfarb, Braunstein and Lorge (1956) noted that if some speech is present it is not reinforced by appropriate gestures. Kanner (1946) pointed out that the speech of the autistic child is not communicative. DeHirsch (1967) also suggested that there seems to be a total lack of "communicative intent" in the autistic child. The autistic child also has difficulty understanding others who speak to him. Hingtgen and Coulter (1967) reported that the ability of autistic children to understand dropped sharply when gestures and other visual cues were reduced or stopped. Thus the severely emotionally handicapped child not only can't be understood by others but he can't understand the speech of persons who speak to him.

SPEECH AND LANGUAGE IN MENTALLY HANDICAPPED CHILDREN

In recent years there has been a tremendous increase in research related to the speech and language of mentally handicapped children. There have been a number of comprehensive reviews written (Blount, 1968; Jordon, 1967; Matthews, 1957; McCarthy, 1964; Schiefelbusch, 1969; Spradlin, 1967; Spreen, 1965a, b). Peins (1970) has published an extensive bibliography. Fulton and Lloyd (1969) have provided an extensive review of hearing research with the retarded. There has been a great deal of research since these reviews were published. Recently researchers have been directing their research to very specific topics in language. This more recent research also reflects many of the developments in the fields of cognitive psychology and applied linguistics. Since the focus of this review is oral language, the cognitive development of mentally handicapped children will be dealt with only superficially.

Our intent is to provide a comprehensive review of research concerned with the spontaneous language acquisition of mentally handicapped preschoolers, although some of the research reviewed will deal with older children. The review is divided into sections on phonological, lexical, morphological, syntactic, and pragmatic development. Our emphasis will be on research of the last 6 to 7 years since, as mentioned above, there are comprehensive reviews of previous work.

Phonetic and Phonological Development

The sound system used by mentally handicapped children has been extensively studied from a clinical viewpoint. There are several excellent reviews of this literature (Goertzen, 1957; Schneiderman, 1955; Spradlin, 1963; Webb & Kinde, 1967; Zisk & Bailer, 1967).

Incidence

Keane (1972) has provided the most recent review of the incidence of speech problems in the mentally handicapped. The incidence of speech disorders in the retarded population is much higher than in the non-retarded population and the incidence increases with lower intelligence (Spreen, 1965a). Institutionalized retardates have the highest incidence of speech disorder: Gens (1951) reported 70-75 percent; Bibeg (1951) 66 percent; Sachs (1951) 57 percent, Schlanger and Gottsleben (1957) 79 percent; Sheehan, Martyn, and Kilburn (1968) 49.5%; and Haviland (1971) 76 percent. Earlier researchers (Kennedy, 1930; Lewald, 1932; Sirkin & Lyons, 1941) reported similar percentages. There is some indication that incidence in day care centers is also high. Lubman (1955) reported 82 percent, Schneider and Vallor (1954) 72 percent, and Marshall (1967) reported 40.5 percent. There is some indication that mentally handicapped children in the public schools have a lower incidence although their average intelligence was much higher: Louttit and Halls (1936) reported 9.4 percent; Wallin (1949) reported 26 percent; Watnick (1967) reported 24.3 percent; and Donovan (1957) reported that 8 percent had "severe" speech defects.

Some of the researchers studying incidence have attempted to classify by type of speech disorder. Most use different classification systems which makes their results almost impossible to compare. Schlanger and Gottsleben's (1957) study of 516 institutionalized retarded children seems to report relatively representative results. They reported that about 78 percent of the retarded children with speech defects had articulation problems, 47 percent had voice disorders, and 17 percent stuttered.

The lack of uniform criteria and definitions in these incidence studies make it possible to draw only relatively general conclusions. Speech disorders are more prevalent in the retarded population especially if the child is in an institution. Generally, the more mentally handicapped the child is the more likely he will have speech problems and the more severe they will be. Articulation problems are most prevalent, then voice, and then stuttering.

Articulation

The studies of incidence give us little specific information about the articulation problems of retarded children. Most authors make relatively general statements. J. Bangs (1942) concluded that retarded children make about the same type of errors as normal children. He reported a somewhat higher incidence of omissions of final sounds and that there were some bizarre errors that are not usually found in normal children. Karlin and Strazzula (1952) reported that the error pattern for consonants for retardates and normals are very similar. Matthews (1957) concluded that articulation defects of the mentally retarded do not differ in kind from that in the non-retarded speech defective population. These studies do not provide a very specific description of the linguistically relevant phonological problems of the retarded. What is needed is a linguistically oriented phonological description of the speech of mentally retarded subjects similar to that suggested by Compton (1970). A systematic study of the phonological development of young mentally retarded children should also be a high priority.

Voice Problems

A number of investigators (Benda, 1949, 1965; Blanchard, 1964; Novak, Sedlackova, Klajman, & Betlycwski, 1967; Schlanger, 1962; Strazzulla, 1953; Tredgold & Soddy, 1963; West, Kennedy, & Carr, 1947) have reported that a large proportion of retarded children especially those with Down's syndrome have voice problems. These clinicians reported that the speaking fundamental frequency of this group is lower than normal. Michel and Carney (1964) studied the speaking fundamental frequency of eight 10-year-old institutionalized Down's syndrome males, Hollien and Copeland (1965) studied a similar group of nine 11-year-old females, and Montague, Brown and Hollien (1974) studied twenty 7 to 13-year-old males and females of a similar classification. All of these investigators reported that speaking fundamental frequency levels for Down's syndrome children were approximately the same as intellectually average children of the same age. The only study that dealt directly with the voice problems of preschool age mongoloid children was conducted by Weinberg and Zlatin (1970). They compared the speaking fundamental frequency of 27 non-institutionalized children with a CA from 5 years, 1 month to 6 years, 11 months ($\bar{X}$ = 5 years, 11 months) with an age-matched control group of non-retarded children. They reported that the speaking fundamental frequency of mongoloid preschool children is significantly different and in fact higher than that of non-retarded children. Whether the fact that the subjects in this study were home-living and younger can explain the divergence of the results with previous studies is still open to question. Even though the comparison groups were age-matched the mongoloid group was smaller physically and this may account in part for the higher fundamental frequency. Certainly more research in this area is needed. Possibly vocal characteristics may be important in determining various subgroups within mongolism.

Stuttering

There is considerable evidence that the incidence of stuttering in the retarded population is much higher than in the non-retarded population. In special classes for retarded children in the school where higher average intelligence scores and better verbal ability is expected the incidence is approximately 3 percent (Ballard, 1912; Karlin & Strazzula, 1952; Louttit & Halls, 1936; Lubman, 1955; Wohl, 1951). There is considerable disparity among incidence figures reported for institutionalized retarded children with the range from below 1 percent to slightly above 20 percent (Chapman & Cooper, 1973; Martyn, Sheehan, & Slutz, 1969; Schaeffer & Shearer, 1968; Schlanger & Gottsleben, 1957; Sheehan, Martyn, & Kilburn, 1968; Sirkin & Lyons, 1941). This is probably accounted for by the heterogeneity of the institutionalized population and the institutions themselves. Mongoloid children as a group have a much higher incidence of stuttering than the remaining retarded population. Gottsleben (1955) and Schlanger and Gottsleben (1957) report 33 and 45 percent respectively for groups of mongoloid children. Cabanas (1954) noted an exceptional amount of speech interruption in a group of mongoloids but found little evidence of anticipations, substitutions, or avoidance devices. Martyn, Sheehan, and Slutz (1969) also reported little anticipation or avoidance in mongoloid stutterers. However, Lerman, Powers, and Rigrodsky (1965) presented evidence that the stuttering of retarded children is comparable to that of intellectually average children in its early stages and that fears, avoidances and other symptoms secondary to the stuttering also occur. Chapman and Cooper (1973), in a study of 36 institutionalized retarded persons between the CA's of 12 and 78, concluded that the stuttering in their subjects was subject to the same laws as that of non-retarded stutterers with respect to the adaptation, consistency, and expectancy phenomenon reported in traditional literature (Bloodstein, 1969; Johnson, 1955). There are no studies that report specifically the incidence of stuttering in preschool age mentally handicapped children on deal with the early stages of stuttering that would be expected in this young retarded population.

Hearing Problems

Studies that have reported the incidence of hearing problems in the retarded population suffer from criteria and procedural inconsistencies. For example, Webb, Kinde, Weber, and Beedle (1964) found that a 40.5 percent incidence figure would be reported if the criterion of a 15-decibel loss at two or more frequencies were used, while if a 20-decibel loss at two or more frequencies criterion were used about 24 percent of the retarded population would have hearing loss. We would conclude from a review of a number of studies that between 13 to 56 percent of the retarded population have hearing loss and that these figures vary with the level of retardation and the testing techniques (Birch & Mathews, 1951; Bradley, Evans & Worthington, 1955; Fulton & Lloyd, 1968; Foale & Patterson, 1954; Glovsky, 1966; Johnson & Farrel, 1954; Kodman, 1958; Kodman, Powers, Weller, & Philip, 1956; Lloyd & Reid, 1965; Rigrodsky, Prunty & Glovsky, 1961; Schlanger, 1953; Schlanger & Gottsleben, 1957). Glovsky (1966) reported that 70 percent of persons diagnosed as mongoloid have hearing impairment, however Fulton and Lloyd (1968) found that only 39 percent of mongoloid persons have hearing loss. Adequate procedures for testing the hearing of young moderately to severely retarded children are being developed (Fulton & Lloyd, 1969; Lloyd & Fulton, 1970). These improved procedures assure proper attention, orientation to the test stimuli, and adequate conditioning within the testing situation. These procedures should provide better information about the hearing problems of the mentally retarded.

Causation

While the higher incidence of articulation, voice, stuttering, and hearing problems in the retarded population is well documented, the reasons why this is so have not been adequately investigated. The figures do suggest that there is a strong relationship between speech problems and mental age or severity of retardation. Mental age is especially closely related to articulation development (Schneiderman, 1955). Webb and Kinde (1967) also suggest that motor difficulty, perceptual problems and environmental deprivation are important causative agents. The hearing problems of the retarded may also contribute to the higher incidence of articulation and voice problems. Lenneberg (1967) suggested a lack of motivation for good speech in the retarded population. Zisk and Bailer (1972) suggested the following agents as predisposing mongoloid children to articulation and voice problems: the anomaly of their oral structures and associated anatomy, together with other anatomical and physiological stimata such as position of larynx and spinal and abdominal abnormalities, and hearing loss. There is also a higher incidence of hypotonia in the retarded population, especially in mongoloids (Benda, 1956; McIntire & Dutch, 1964). Retarded persons may also experience difficulties with kinesthetic and proprioceptive feedback (Frith & Frith, 1974).

Relationship to Language Development

A relevant and as yet unanswered question concerns the influence of the retarded child's speech disorders on his language development (Webb & Kinde, 1967; Mittler, 1972). The child's speech disorders may prevent him from being understood by those around him. This may discourage him from talking and this may result in a reduction in his opportunity for communicative exchange, verbal practice and ultimately a lack of language development. Some investigators (Davis, 1937; Schneiderman, 1955; Williams, McFarland, & Little, 1937; Yedinak, 1949) have suggested that for non-retarded preschool children there is a relationship between length, completeness, and grammatical complexity of sentences and articulatory ability. There have been no studies of this relationship in preschool retarded children.

Vocabulary or Lexical Development

The relation between mental retardation and vocabulary or lexical development is quite obvious. Retardation is most often defined, in part, through poor performance on standardized intelligence tests which are often heavily weighted with vocabulary items. In fact of all the subtests on intelligence tests, vocabulary subtests have the highest correlation to overall IQ scores (Dunn, 1959; Dunn & Brooks, 1960; Heber, 1961).

Generally, the research on the vocabulary development of mentally retarded children can be divided into studies that deal with the quantity of vocabulary at various levels of development and studies that deal with the quality of vocabulary.

Quantity of Vocabulary

A number of investigators have reported significant differences in the number of words used and understood by normal and retarded children who are not matched on MA. When retarded and normal children are matched for MA most investigators report no significant difference between the two groups (Bartel, Bryen, & Keehn, 1973; Lyle, 1961; Papania, 1954; Waters, 1956). Spreen (1965) reviewed several studies which lead him to the conclusion that there was a small delay in the percentage of nouns used but that matched MA retarded children had larger vocabularies, although more recent investigators have not reported this (Bartel, Bryen, & Keehn, 1973).

Quality of Vocabulary

Generally, the words in the basic vocabulary of MA matched normal and retarded children are the same (Beier, Starkweather, & Lambert, 1969; Lozar, Wepman, & Hass, 1972; Mein & O'Connor, 1960). For both groups of children, their recognition and use of words are influenced by meaningfulness and specificity and concreteness of test stimuli (Jones & Spreen, 1967; Spreen, Borkowsky, & Gordon, 1966). Retarded children have more difficulty recognizing abstract words (Spreen, Borkowsky, & Gordon, 1966). They also define and associate words at a lower level of abstractness (Badt, 1958; Keilman & Moran, 1967; Papania, 1954).

Morphological Development

Jordon (1963) suggested that through the study of morphological development in the retarded it might be possible to determine whether they learn the rules of language by stereotype or by reason. Dever (1966) speculated that foundation of morphological rules may be a specific problem area for retarded persons. There are several sources of information concerning the morphological development of retarded children. These include studies employing Berko's (1958) test of morphology; Fraser, Bellugi, and Brown's (1963) test of imitation, comprehension, and production; the grammatic closure subtest of the Illinois Test of Psycholinguistic Abilities (Kirk, McCarthy, & Kirk, 1968); Carrow's (1973) Test for Auditory Comprehension of language; and studies that analyze spontaneous speech responses of retarded children. There are two other potential sources of information about the morphological development of retarded children. These are Chappell's (1968) Picture Test of English Inflections and Berry and Talbot's (1966) Exploratory Test of Grammar. No studies using these two tests with the retarded have been published.

Berko's Test

The methods employed by Berko (1958) in her pioneering work investigating the morphological skills of kindergarten and first grade non-retarded children have been used by a number of researchers to investigate these skills in retarded children.

Newfield and Schlanger (1968) compared 30 retarded with 30 non-retarded children using Berko's procedures. The mean CA for the retarded group was 10 years, 4 months, with a mean mental age of 6 years, 2 months, and a mean IQ of 60. The non-retarded children were kindergarten, first, and second graders with a mean CA of 6 years, 10 months. They reported that the order of acquisition of morphological constructions was similar for the two groups of children. Retarded and non-retarded children master the irregular and less frequently occurring constructions. However, the constructions are acquired more slowly in retarded children. They also found that both groups scored better when the morphological rules were tested using real words rather than nonsense words. They concluded that it was more difficult for the retarded children to generalize the morphological rules from real words to unfamiliar nonsense words.

Lovell and Bradbury (1967) also used Berko's Test to compare the morphological skills of 160 educationally subnormal children in England with the data produced by Berko (1958) for normal children. The CA's of Lovell and Bradbury's group ranged between 8 and 15 years of age with a mean IQ of 70. They reported that even their older children (14 and 15-year-olds) performed more poorly than Berko's normal 6-year-olds. They also speculated that their retarded group lacked the ability to generalize to nonsense words.

Spradlin and McLean (1967) compared the morphological skills of 24 mildly retarded institutionalized adolescents between 12 and 16 years of age with 24 kindergarten children on the Berko Test. They concluded that their kindergarten children showed superior morphological skill when compared with their retarded adolescents. They concluded that the deficits of their retarded adolescents were even more pronounced than one would expect from their behavior on intelligence tests.

Dever and Gardner (1970) administered Berko's Test to two groups of educable mentally retarded public school boys who were matched on Ca and MA respectively with a group of non-retarded public school boys. One group consisted of ten retarded boys ranging in IQ from 60-84 at each of the CA's of seven through ten. A second group consisted of ten retarded boys at each of the MA levels of six through ten. The non-retarded group consisted of five groups of ten boys each at each of the CA levels of six through ten. Results were analyzed using teachers' responses to Berko's Test as the criteria of correctness. In general, neither group of retarded boys performed as well as the non-retarded boys. The retarded boys performed even more poorly than the non-retarded boys of the same approximate mental age. The retarded boys had a strong tendency to simply reject the stimulus word which may indicate a difficulty with "test taking" or knowledge of what responses were required on the test. The nonsense words may have even confused the subjects. Dever and Gardner also reported subjectively that the retarded boys may use a correct morphological structure in their speech but perform incorrectly on the structured test.

Ogland (1972) administered Berko's Test to 182 special class subjects with a CA range of 6,9 to 12,8 with IQ's ranging between 50 and 69. She suggested her subjects' morphological deficiency was beyond MA "expectancy." That is, her subjects' scores were below those reported by Templin (1969) for normal children of similar MA.

Dever (1972) presented a revised version of Berko's Test, which included both real and nonsense words, to 30 educable mentally retarded public school children whose IQ's ranged between 60 and 84. There were six children in each of the mental age groups of 6, 7, 8, 9, and 10. Two samples of the free speed was also elicited from each of the children. The morphological constructions tested were compared with the same constructions in the free speed samples to assess whether the test predicted the occurrence or non-occurrence of the error in free speech. Correlational analyses suggested that performance on Berko's test did not predict performance in free speech. Generally the subjects performed much better in free speech. They also made slightly fewer errors when real words rather than nonsense words were used as test stimuli.

Bradbury and Lunzer (1972) conducted a study that compared the acquisition of morphological skill in a group of 18 educationally subnormal children in England of CA 9-10 with 18 normal children of CA 6-7. This study was designed to test if retarded children are less able to generalize morphological rules to novel or nonsense words. Subgroups of both the subnormal and normal groups were required to learn one of three morphological rules (plural, past tense, or possessive). The suffix was a nonsense particle at the end of 10 nonsense words. In some subgroups the 10 nonsense words was followed by the same nonsense particle which meant that the rule was "universal." In other groups five of the nonsense words were marked by one suffix while the other five were marked by a second suffix. This rule was called "dichotomous" and was meant to be roughly synonomous with the English plural. A third group learned an "arbitrary" rule in which all 10 nonsense words required a different suffix. As would be expected the number of trials required to learn the universally applied rule was significantly less than for the dichotomous or arbitrary rule, which required approximately the same number of trials to learn. More important, however, was the finding that the trials required to learn the various rules were essentially the same for the educationally subnormal and normal subgroups. However, when a transfer task of 30 new nonsense words was presented the subnormals performed more poorly than the normals. Bradbury and Lunzer suggested that this may be because the subnormal children were less willing to search through and utilize the strategies available to them.

In summary, it can be concluded that when Berko-type tests are used to investigate the morphological skills of retarded children compared with non-retarded children, that the sequence of acquisition is essentially the same for the two groups, but that the rate of acquisition is slower for the retarded. Generally the subjects do better when tested with real words and that performance on Berko-type tests may not be a good predictor of morphological skill in free speech. The question of whether retarded children are less able to generalize to new situations is still open to question.

Fraser, Bellugi and Brown's Procedure

There has been only one study with the retarded using the imitation, comprehension, and production procedures developed by Fraser, Bellugi, and Brown (1963) to investigate morphological skills in normal children. Lovell and Dixon (1967) administered a version of these procedures to 80 educationally subnormal children in England with IQ's ranging between 61 and 66. These retarded subjects were divided into two equal groups of 40 representing the CA's of 6 and 7. Additionally, 100 nonretarded children, divided into groups of 20 representing the CA's of 2, 3, 4, 5, and 6, was administered the same test. Lovell and Dixion reported that for all their groups, imitation scores were always higher than comprehension scores, which were always higher than production scores. They reported that the 6-year-old retarded group performed almost exactly like the 3-year old nonretarded children while the 7-year-old retarded group performed like the 4-year-old nonretarded group.

ITPA Studies

The Illinois Test of Psycholinguistic Abilities (McCarthy and Kirk (1961, revised version, 1968) is designed to evaluate, among a number of other skills related to language, morphological skills in children. The auditory-vocal-automatic subtest later called the grammatic closure subtest of the ITPA was patterned after Berko's procedures but uses real words as test stimuli. McCarthy and Kirk (1963) used real words rather than nonsense stimuli because their subjects in preliminary studies showed a tendency to give meaning to the nonsense words; for example, they called "wugs", "rugs." There have been several investigators that have administered the ITPA to retarded children.

Meyers (1963) compared athetoid and spastic children with normal children on the ITPA. Both athetoids and spastics scored below normals. The athetoids scored particularly low on the grammatic closure subtest. This deficit in grammatic closure was also reported by McCarthy (1965) for day school mongoloid children when compared with nonmongoloid retarded children and by Wiseman (1965) for institutionalized educable mentally retarded children. Mueller (1964) found that the profiles for educable mentally retarded children show a surprising consistency and that the subjects all scored low on the morphology subtest. Dillon (1966) used the ITPA to compare 25, 7-12 year old cerebral palsied with 25 non-cerebral palsied children. The subjects were matched on intelligence, age, and sex. The cerebral palsied subjects showed deficits on all subtests of the ITPA including grammatic closure. Bateman and Wetherall (1965) in summarizing some of the ITPA studies on mental retardation stated that there is a typical profile for retarded children. One outstanding feature of this profile is poor performance on the grammatic closure subtest. Recently, Walker, Roodin and Lamb (1975) administered the grammatic closure subtest of the ITPA to 50 institutionalized retarded children divided into groups of 10 at each of the MA levels 3-3.5, 4-4.5, 5-5.5, 6 to 6.5, and 7 to 7.5. They found that grammatic closure scores improved progressively with MA.

Carrow's Test

Carrow's (1968, revised, 1973) test was designed to assess the lexical, morphological, and syntactic comprehension of children.

Bartel, Bryen and Keehn (1973) have conducted the only study utilizing Carrow's test with the retarded. They administered Carrow's Experimental Test of Linguistic Comprehension to a random sample of trainable retarded children, stratified on the basis of MA and CA. The subjects' MA's ranged between 2.7 to 6.0 years with a CA range from 9.1 to 12.9 years. The responses of the retarded subjects were compared with Carrow's normative group at the same MA. The retarded subjects showed the greatest difficulty with the grammatical categories, especially those containing gender and number of pronouns and number of nouns and verbs.

Syntactic Development

Information concerning the syntactic development of retarded children is very sparse. Most of the investigations before the early 1960's were very general in nature and suffered from lack of linguistic sophistication of the investigators. Only recently have trained linguists and psycholinguists become interested enough in the syntax of the retarded to study it utilizing modern linguistic methodology.

Early Traditional Studies-Sentence Length and Complexity

Most of the early studies (before about 1965) utilized traditional descriptive linguistic methodology which emphasized measures such as average length of sentences and sentence complexity.

Carlson and Carlson (1945a,b) in very early studies of the language of mentally retarded adolescents found that the syntax of their retardated subjects differed from that of their nonretarded subjects and that the language retardation was beyond MA expectancy. They collected samples of the speech of a group of normal children matched on MA, sex and socioeconomic status with a group of 61 institutionalized retarded subjects with a mean IQ of 59.6 and a group of 80 noninstitutionalized retarded subjects with a mean IQ of 67.5. The retarded subjects' language differed from that of the nonretarded subjects on a number of dimensions. It is impossible to conclude from this study whether syntactic characteristics of the retarded subjects' language would be similar to that of nonretarded children of a lower MA but we can conclude that the syntactic deficiency of the retarded subjects was beyond what would be expected when MA's were matched.

Mecham (1955) used pictures from the Children's Apperception Test to elicit speech samples from 41 retarded subjects ranging in CA from 9-18 years with a mean of 12.4 years and an IQ range of 49-75. He reported that the correlation of mean sentence length with IQ was +.42 which was significant at the .05 level of significance. Schlanger (1953b) reported a correlation of +.63 between MA and mean sentence length.

Siegel (1962) also used pictures from the Children's Apperception Test to elicit language sample from 30 institutionalized retarded children with a CA range of 11 to 17 years with a mean of 14.6 years. These subjects represented the upper 15% of the population of the institution selected on the basis of the Parson's Language Sample (Spradlin, 1960). The average length of sentence for these subjects was 6.4 which averaged about one word less per sentence than Templin's (1957) 8-year old nonretarded group.

Goda and Griffith (1962) studied the elicited language samples of 106 institutionalized, retarded adolescents ranging in CA from 13 to 21 years with a median of 16 years. Mental ages ranged from 6 to 13 with a median of 9.5 years and IQ ranged from 45 to 85 with a median of 60. The performance of the retarded subjects was compared with Templin's (1957) data for nonretarded children. The mean length of sentence of the retarded subjects compared with Templin's normal children at the CA of 7 years. The sentence complexity of the retarded subjects was similar to Templin's 6 and 7 year old CA groups. Ogland (1972) found more recently that the mean length of sentence of retarded children between the CA's of 6.0 and 12.8 years were lower than would be predicted by mental age.

Lyle (1961) measured the sentence complexity of a group of relatively low-level retarded subjects who were matched with normal subjects on CA, and reported that the sentences of the retarded subjects were considerably less complex.

Current Syntactic Research

In the mid 1960's investigators interested in the language of the mentally retarded became more influenced by the generative-transformational grammar introduced by Chomsky (1965, 1968).

Lenneberg, Nichols and Rosenberger (1964) studied the language acquisition of 61 home-raised mongoloid subjects for a three year period. Subjects were of different ages between 3 and 22 years. Younger subjects were seen more often than older with 2.5 observation as the average. They tape recorded the subjects' spontaneous oral response and administered a sentence repetition task. They concluded that stages of language acquisition (mostly babble, mostly words, primative phrases, and sentences) are more significantly related to CA and the appearance of motor milestones than to IQ. The subjects performed like younger normal subjects on the sentence repetition task. They concluded that their mongoloid subjects followed normal sequence of language development but at a slower rate and that they did not evidence bizarre language behavior.

Lackner (1968) made tape recordings of the language of five retarded children with a MA between 2.3 and 8.10 years three times a day for an eight-week period. One thousand sentences for each child were selected from these extensive protocols. He then wrote transformational phrase structure grammars for each child's sample. He also wrote a grammar for five normal children with CA's between 2.8 and 5.9 years. He also administered tests of imitation and comprehension to the same children. He reported that mean sentence length increased with MA and was the same for retarded and nonretarded children of the same MA. There was also a systematic appearance of sentence types as MA increased. He described the development of syntax through declarative, negative, interrogative, negative interrogative, passive sentences and beyond. This development in sentence type was also closely tied to increasing MA. Simple declarative sentences were prevalent in both groups at an MA of two to three years while negative passive interrogative sentences did not appear until about an MA of 8 to 10 years was reached. A more complex sentence type was found only if a sentence type of less complexity was already present. Further, each phrase structure grammar was a subset of the grammar at the next level of complexity. Lackner reported that the number and types of transformations understood in comprehension tests as well as the number of transformations used in elicited speech and in imitation tests, also increased progressively with MA. As has been reported in other studies, these children could imitate and comprehend sentences constructed from their own vocabulary following the sentence types and complexity present in their spontaneous speech, but they could not comprehend or imitate sentences of more advanced types. He concluded that the syntax of normal and retarded children is not different, but that retarded children are simply slower in development and the development is eventually arrested at normal but lower stages.

Graham and Graham (1971) studied the elicited language samples of nine institutionalized retarded males with CAs 10-18 years and MAs 3.6 to 10 years and IQs between 26 and 64. They analyzed these samples by writing the underlying strings of the utterances and the elementary transformations and generalized transformations that were used by each child. Elementary transformations resulted in changes in the underlying base strings through such operations as addition, deletion, or substitution while generalized transformations acted on two or more underlying strings to produce a single derived structure usually through conjoining or embedding. They found a trend from the lower MA children producing sentences containing base string rules only and few or no transformation to higher aged children using three or more transformations. Mean length of sentence also increased with MA from 3.8 words and MA 3.6 to 8.0 words at MA 10. The use of more generalized transformations also increased with MA. Graham and Graham concluded that retardates develop syntactic rules at a slower rate but in a similar order as normal children.

Since Fraser, Bellugi, and Brown's (1963) development of their imitation, comprehension and production tasks, there has been a tremendous interest in applying these tasks to retarded children to study both morphological development (reviewed previously) and syntactic development. Lovell and Dixon (1967) found that imitation precedes comprehension, which precedes production skills in both retarded with IQs between 61-66 and nonretarded subjects. The rank order of difficulty of syntactic contrasts was essentially the same across tasks for both groups. Graham and Guilford (1968) replicated the finding of Lovell and Dixon (1967). They also reported that the ability of their retarded subjects to repeat a sentence depended on the sentence type and the subject's short term memory. Lovell, Hersee and Preston (1969) recorded the free speech of a group of retarded children between the CA of 8 to 15 years in a special school and administered the test of recognition of syntactic similarity (Brown & Berko, 1960) to them. They reported that the free-speech syntax of their subjects of CA 8, 9, and 10 was comparable to that of Menyuk's (1964) nursery school subjects. They also reported that the ability of their older subjects to recognize syntactic similarities was below that reported for 8-year-old normal children (Brown & Berko, 1960). Anastasiow and Stayrook (1973) presented a sentence immitation task similar to Menyuk's (1964) to 105 black educable mentally retarded subjects with CAs between 9 and 12 years and to their CA and MA nonretarded peers. Their results indicated that the retarded children were similar to their CA peers on concrete word errors and roughly comparable to their MA peers on function word errors.

At least two standardized tests that examine syntax have been used with the retarded.

Walker, Roodin and Lamb (1975) administered the Northwestern Syntax Screening Test (NSST) (Lee, 1969) to 50 institutionalized retarded children. There were 10 subjects at each of the MA levels; 3 to 3.5, 4 to 4.5, 5 to 5.5, 6 to 6.5 and 7 to 7.5. The NSST consists of 40 receptive stimulus items and 40 expressive stimulus items. Their results showed that the scores of the subjects' programed with MA. Expressive scores were substantially lower than receptive scores for all MA levels. This was not the case in the nonretarded children described by Lee (1969). Walker, Roodin and Lamb concluded that the expressive items placed a greater load on the subjects' short-term memory ability than did the receptive items.

Bartel, Bryen and Keehn (1973) administered Carrow's (1968) Experimental Test of Linguistic Comprehension to a sample of special class retarded children with CA 9.1 to 12.9, MA of 2.7 to 6.0, and IQ from 23 to 50. A random sample of subjects were selected from all of the trainable retarded children in the schools of Philadelphia and then stratified on the basis of IQ and CA. Data from each subject group were compared with Carrow's (1968) data for 159 nonretarded children between the CA 2.10 to 7.9. The retarded subjects experienced difficulty in a number of syntactic categories including negative transformations, predication, and complementation. The gap between retarded and nonretarded children on syntax widened as MA increased. With increasing age the nonretarded child becomes fluent on increasingly more complex sentences with the retarded child seems to reach a plateau.

Thus most of the studies suggested that the early syntax of retarded children develop in much the same way as the nonretarded but that the retarded are slower in development and may reach a plateau without acquiring some of the more complex syntactic constructions. There are other investigators who have suggested that syntactic development in the retarded is not only slower but qualitatively different.

The performance of retarded children on cloze tasks, in which the subject must provide some missing sentence part, suggest more than a simple delay in the retarded child's development. When retarded children are matched on MA with normal children significant differences are reported between the two groups (Semmel, Barritt & Bennet, 1970; Goodstein, 1970).

Semmel and Bennet (1970) required mentally retarded children with CAs between 9 and 14 years and a mean MA of 8 years from a special school to recall sentences differing in grammaticalness and amount of association between component words. They reported that their retarded subjects had relatively weak recording abilities and use less of the associative and syntactic cues in the verbal material than are required to process.

Studies of language comprehension also sometimes reveal evidence of specific differences in the functioning of retarded and nonretarded children. Semmel and Dolley (1971) administered a sentence comprehension test to 40 mongoloid children with CA between 6 and 14 years and IQ between 22 and 62. The subjects correctly responded to simple declarative sentences but understood negative sentences less often than would be expected by chance. The subjects' understanding of passive and negative passive sentences was within chance levels.

Cromer (1972) administered a comprehension test, in which the subjects had to act out certain roles with puppets, to 30 mentally retarded children with CA between 7.1 and 16.6 years and IQ between 36 and 68. The subjects responded to sentence contrast pairs such as "John is eager to please" and "John is easy to please." In the first sentence John is the actor, he does the pleasing, while in the second someone pleases John. Thus the sentences had identical surface structures but different deep structures. Cromer concluded that the retarded subjects used strategies of a primitive rule type to comprehend the sentences. Cromer hypothesized that specific learning strategies present in older nonretarded childred (approximately CA 10) may be missing in retarded children even at the older age levels.

These studies seem to suggest that it is possible that retarded children somewhere in their development and for some aspects of language process language in ways that specifically contrast with non-retarded children.

Pragmatic Communication Development

Although poor interpersonal communication skills are a defining characteristic of retarded persons (Heber, 1959; Keane, 1972; Sarason & Doris, 1969), there have been very few studies of the retarded child's ability or lack of ability to use his language for communication. There is ample evidence that poor communication skills in retarded children is a deterrent to social adjustment (Cawley, 1965; Fiester & Giambra, 1972; Talkington, Halls, & Altman, 1971). Schiefelbusch (1969) defined communication as those language events, including verbal and gestural, that are interpersonal. Miller (1951) formulated the interpersonal communication process in terms of a speaker who has some "intent" - some message to communicate, and a listener who is disposed to receive that message. Communication is effective when the listener's behavior is modified by virtue of the speaker's verbal behavior. The studies in this area can be divided into two groups; those that deal with adult-child dyadic interactions and those that deal with child-child dyadic interactions.

Adult-Child Dyads

Certainly the most ambitious research program undertaken in this area was undertaken by Siegel (1967) and his associates.

Siegel observed within an institutional environment that there was considerable variability in the quantity and quality of adult verbal interaction directed to retarded children dependent on the child's verbal skill. To test these observations Siegel (1967) and his associates assembled non-retarded adults with retarded children of high and low verbal ability as measured by the Parsons Language Sample (Spradlin, 1963) and the Templin and Darley (1960) articulation test.

Siegel and Harkins (1963) and Siegel (1963a) had adults interact with high or low linguistic level retarded children with a mean CA of 12 years. Analysis of the tape recordings of the sessions revealed that the adults had greater vocal output, but used shorter sentences and more redundant language with the low children. Redundancy was measured by type-token-ration (TTR), the total number of words in a sample compared with the number of different words. Mean length of the adults' responses (MLR) was even lower than Templin (1957) reported for normal eight-year-olds.

Spradlin and Rosenberg (1964) had adults interview institutionalized high and low level retarded children for four half-hour sessions. Significantly lower TTR's were again reported for the adults that interviewed the low children and these results were consistent over the four sessions.

Siegel (1963b) tested the effects of labeling retarded children as high or low on adults' verbal interaction. A group of 40 low children were arbitrarily labeled either high or low and the labels were revealed to the adults. The label seemed to have little effect on the adults' interactions. They behaved very much like the adults who interacted with low children in the Siegel and Harkins (1963) study.

Buium and Rynders (1973) and Marshall, Hegrenes and Goldstein (1973) examined the speech of mothers of mongoloid children and other moderately and severely retarded children compared with the speech of mothers of non-retarded children. They found that retarded children are exposed to fewer relatively long utterances, to a greater frequency of grammatically incomplete sentences, imperative sentences, single word responses, and generally to more syntactically and morphologically simple productions. Jeffree and Cashdan (1971) found that mothers of severely retarded children asked many questions of their children, apparently in an attempt to get them to talk. The questions were of a simple type that could be answered with a single word.

Kogan, Wimberger, and Bobbitt (1969) and Kogan and Tyler (1973) compared the verbal and non-verbal interaction patterns of preschool physically handicapped, mentally retarded, and non-handicapped children and their mothers. Mothers of handicapped children displaced a greater incidence of assertive control and "warm" behaviors than did the mothers of non-handicapped children.

These experiments have shown that the verbal behavior of adults is significantly influenced by the child with whom they are talking. This interaction is influenced by the level of the child and takes the form of increased redundancy, shorter and simpler sentences, more imperatives, and simpler questions with low level children. The effect that this adult behavior has on the spontaneous language acuqisition of retarded children is still open to question and there have been only a few studies designed to help answer it and the results of these studies are equivocal.

Siegel and Donovan (1964) trained a female adult experimenter to systematically vary her TTR in stories told to high and low linguistic level retarded children. After the children were told stories of high or low TTR they were encouraged to tell their own story. Both high and low children uttered significantly more words after low TTR stories than high TTR stories. In a subsequent study Golle (1966) under the direction of Siegel prepared stories with high and low TTR values and had experimenters read the stories to mentally retarded children. The results of these stories on the children's subsequent output were equivocal and did not replace Siegel and Donovan's results.

Child-Child Dyads

There have been relatively few experimental studies of the interpersonal communication behavior between retarded persons. Rosenberg, Spradlin, and Mabel (1961) arranged a series of two-person interactions which consisted of: (a) two high linguistic level retarded children, (b) two low linguistic level retarded children, and (c) a heterogeneous grouping of one high and one low linguistic level subject. Verbal interaction was greatest when members of the dyad were of the same verbal level, regardless of whether it was high or low. Rosenberg et al. dealt with relatively gross interaction variables, while later investigators examined the controlling relations of the behavior of the two persons in the assembly. Evans (1965), Hollis (1966), and Spradlin, Girardeau, and Corte (1967, 1969) studied the effects of various reinforcements on the social and communication behavior of retarded adolescents. In these experiments one subject (the operator) could deliver reinforcement to himself or to both himself and a second subject (the receiver). Although the receivers had not direct control over dispensement of reinforcement, they were able to influence the operators to give them reinforcement most of the time. These studies demonstrated that if reinforcement is given, retarded persons will share, cooperate, and communicate, and that they are socially responsive if it does not cost them reinforcement.

Longhurst (1972) described a two-person communication task used to study communication in retarded persons. This task had been used previously to study the devleopment of referential communication in intellectually average children (Glucksberg, Krauss, & Weisberg, 1966; Krauss & Glucksberg, 1969) and inter-personal communication in adults (Krauss and Weinheimer, 1964, 1967; Longhurst and Siegel, 1973). In this task one person was designated as the speaker and the other as the listener. Both had a set of stimuli, and it was the task of the speaker to communicate with his partner across a visual barrier so that his partner could correctly select which stimulus of an array was being described at any time.

Four interpersonal communication experiments utilizing this task were described by Longhurst (1974). Experiment 1 investigated the communication behavior of matched pairs of retarded children with CA between 11.5 and 18.2 years at three measured intelligence-adaptive behavior levels (Levels 1, 2, 3). The results of Experiment 1 demonstrated that for all three groups the communication was poor and did not improve over repeated trials. Therefore, a series of three additional experiments were conducted to examine systematically the contribution of the speaker and listener to failure in the task. Since non-retarded adults perform the speaker and listener tasks essentially without error, they were used to measure the effectiveness of the retarded speakers and listeners used in Experiment 1. Thus, Experiment 2 examined the behavior of the retarded listeners from Experiment 1 when read descriptions previously given by non-retarded adults. The retarded listeners did quite well when given descriptions produced by non-retarded adults. Their performance averaged about 50 percent better than in Experiment 1. In Experiment 3 non-retarded adult listeners were read the descriptions given by retarded speakers in Experiment 1. These descriptions given by retarded speakers were only slightly more effective with non-retarded adults than with their retarded peers listeners in Experiment 1. An additional experiment was designed to test whether the descriptions given by the retarded speakers in Experiment 1 were idiosyncratic, that is, whether they had meaning to the speaker himself but not to his retarded listener in Experiment 1 or his nonretarded adult listener in Experiment 3. Thus, in Experiment 4 the experimenter read the descriptions given by the speakers in Experiment 1 to the same speakers now in the listener's role. The speakers' descriptions were idiosyncratic, that is, they now performed considerably better than their listeners in Experiment 1. There were usually group differences in these experiments. Higher level subject dyads were more effective communicators than lower level subject dyads.

There is little evidence to explain why a speaker will modify his verbal behavior as a function of the characteristics or behavior of his listener. This interpersonal communication skill may be the result of a long history of previous learning. Speakers may be reinforced for varying their verbal behavior in accord with the characteristics of their listener. It is known that young children and retardates are relatively unwilling or unable to modify their verbal behavior as a result of feedback from their listeners (Glucksberg, Krauss, & Weisberg, 1966; Krauss & Glucksberg, 1969). Nonretarded adults are very sensitive to their listeners, and under most conditions are willing and able to modify their speech accordingly (Krauss & Weinheimer, 1964b, 1966; Siegel, 1967). It may be that specific feedback or reinforcement mediated by a listener would cause young retarded speakers to modify their descriptions.

Longhurst (1975) designed an experiment to test this question. In the previous experiments conducted by the author with retarded children, the dyads were never told whether their choices were correct or wrong. An experiment was conducted to assess the effects of feedback (telling the dyad whether the listener got a choice right or wrong) and reinforcement (giving each subject one-half cent for each right choice and taking away one-half cent for each wrong choice) on the communication behavior of retarded children. The results of this experiment suggested that both procedures cause speakers to modify their descriptions somewhat over a series of trials with reinforcement casuing a greater amount of modification.

Longhurst and Berry (1975) conducted an investigation designed to examine retarded subjects', (CA 10.3-21.7 years) response to direct listener feedback. It was designed to determine what level of feedback (gestural, implicit, explicit) indicating failure of the listener to make a choice was necessary to cause retarded speakers at the three measured intelligence-adaptive behavior levels to redescribe the stimuli. The type of response given was also investigated. An experimental confederate gave predetermined gestural and verbal feedback in response to the subjects' descriptions. Results showed that all three level groups responded to explicit feedback with redescriptions while only higher level subjects responded appropriately to implicit or gestural feedback. Higher level subjects usually responded with new or modified descriptions while lower level subjects tended to repeat their old descriptions or simply remain silent.

Longhurst (1976) also designed a study to examine whether grouping retarded subjects by their measured intelligence-adaptive behavior levels would facilitate communication. Rosenberg et al., (1961) found that homogeneous dyads communicated much more than heterogeneous dyads. Longhurst also studied homogeneous and heterogeneous groupings. He compared communication in homogeneous dyads that were made up of a level 1 speaker and level 3 listener and dyads that were made up of a level 3 speaker and a level 1 listener. Homogeneous level 1 dyads communicated most effectively with heterogeneous level 1 speaker, level 3 listener dyads only slightly less effective. Communication was quite ineffective when heterogeneous level 3 speakers and level 1 listener dyads and homogeneous level 3 dyads intersected. Thus the importance of the speakers role in this communication situation was emphasized.

General Conclusions

Generally retarded children are consistently reported to be deficient at all levels of language and in interpersonal communication skills. These deficiencies increase with lower intelligence levels. Some language deficiencies, especially in the quantity of vocabulary, appear to be directly related to mental age. This appears to be so for some aspects of syntactic and monophological development. The resultant conclusion is that retarded childrens' development is simply a slower version of nonretarded childrens' development. However, there is increasing evidence that the qualitative and processing aspects of retarded childrens' development may be different than MA in retarded childrens'.

RELATED TOPICS

Effects of Institutionalization on Language acquisition'

Almost all the investigations that compared institutionalized and non-instutionalized retarded children have reported significantly lower levels of language functioning in institutionalized children. Institutionalized retarded children were inferior to non-institutionalized retarded children matched for MA and CA in verbal intelligence (Lyle, 1959), paradigmatic associations for all grammatical classes on free word association tasks (Semmel, Barrit, Bennet, & Perfetti, 1968), use of propositions (Montague, Jensen, & Wepman, 1973), general verbal output (Schlanger, 1954), abstraction scores on vocabulary tests (Badt, 1958) and in ITPA scores (Sievers & Essa, 1961; Mueller & Weaver, 1964). Lyle (1960) reported institutionalized retarded to be significantly poorer in verbal performance than non-institutionalized peers when prior to institutionalization they had been equivalent.

However, it may be that these apparent language deficiencies may be a result of emotional and personality difficulties which are more likely to be found among institutionalized subjects. Lyle (1961b) supplied a control for this alternative in correlating language data and personality ratings. MA and CA proved to be better predictors of verbal achievement than any of the personality variables. Thus, institutionalization has a negative effect on language development exclusive of emotional problems. Some institutional inadequacies in meeting the developmental needs of retarded children have been discussed by Warren and Mondy (1971) and Klaber (1969). Tizard and associates (Tizard, 1970; King, Raynes, & Tizard, 1971; Tizard, Coperman, Joseph,

& Tizard, 1972) have suggested that the concept of the institution as a factor be abandoned in favor of considering more carefully the effects of different institutional regimes on different aspects of development. They suggested that both the child care practice of the staff and the attainments of the children were significantly related to aspects of the formal organizational structure of the institution, that is to sociological factors rather than to psychological characteristics of the staff. However, it is likely that even in those institutions that are well-organized, the situation does not favor language development. Mittler (1972, 1974) has suggested that it is difficult to set up an institutional environment that reinforces rather than discourages language. Factors that characterize many institutional settings are; limited physical and social stimulation, unreinforced association with peers, severance of family ties, systematic anticipation of needs, and lack of social satisfaction from speech, all resulting in a loss of motivation as well as of objective need for extended speech. But, if the disadvantages of institutionalization for language development appear with clarity, we still do not know much about the specific features that account for the superiority of a good home environment. This prevents any systematic improvement of most institutional situations.

Influence of Brain Damage on Language Development

Comparative studies have been done of the language development of so-called brain-damaged or brain-injured and presumably nonbrain-damaged mentally retarded matched for chronological age and intellectual development. The results are largely inconclusive. Bijou and Werner (1944; 1945) found brain-damaged subjects to have a wider vocabulary range and to define more accurately vocabulary items than nonbrain-damaged retarded. However, Waters (1956) failed to discover any significant difference between brain-damaged and familial retardates on vocabulary scores. Moreover, he found familial retardates significantly superior to organic retardates when responses were evaluated qualitatively. Lerea (1961) found brain-damaged retardates inferior to familial retardates on a syllable perception task under different noise conditions. Spreen, Borkovsky, and Gordon (1966), however, did not find significant differences between brain-injured and nonbrain-injured retarded on a one-syllable word recognition task under a noise condition. Also they failed to confirm the hypothesis that brain-injured retardates have particular difficulties with the recognition of abstract words. Hunt (1960) found brain-damaged retardates to understand short stories more poorly than nonbrain-damaged retardates. Gruber and Steer (1966) failed to observe any difference between brain-damaged and nonbrain-damaged retardates in total verbal output in interviews and picture descriptions. Schlanger (1958) found brain-injured retarded children less able to discriminate between similar sounding words. He hypothesized that the deficit might be due to a disturbance in perceptual integration. Gallagher (1957) did not find any difference between the two groups on general language development. Some differences were revealed on particular tasks. Brain-injured retardates were superior on the tasks requiring verbal imitative responses and good speech production, and inferior on ability to integrate verbal concepts and supply missing words in a sentence. Sievers (1959) noted that nonbrain-injured children out-performed significantly brain-injured children at all MA levels on subtests of the DLFT that involve making semantic connection between usual objects.

Thus far there is apparently the possibility that brain-injured children may be impaired in auditory integration but this is all that can be concluded.

Such a negative outcome is hardly surprising in view of the conceptual weaknesses of the opposition between brain-damaged and nonbrain-damaged retarded children. These include; the psychological and neurological criteria for classifying subjects as brain-injured are vague, over-simplified and poorly reliable, and it is not easy to ascertain that so-called nonbraindamaged children are really so. Most subjects in these studies were in the trainable range and it might be as reasonably assumed that all trainable retarded are to some extent brain-damaged. Brain-damaged children do not form a homogeneous group. Their heterogeneity has been largely under-considered in most of the studies. Added to the vagueness of the definition of the brain-injury group as a whole, it probably prevents any sensible approach to the problem.

Language Development in Mongoloid Children

It has been contended that the Down's syndrome condition or mongolism is more damaging to language development than any other etiological factor responsible for mental retardation. Schlanger (1957) and Blanchard (1964) have reported data that apparently go along this line but this research lacked adequate controls. For example, they used institutionalized Down's symdrome subjects and compared them to institutionalized non-Down's syndrome children without controlling for the fact that as Down's syndrome children are detected earlier in life they are likely to be institutionalized at earlier ages. Length, earliness of institutionalization, and possibly higher susceptibility of Down's syndrome children to the frustrations and inconveniences of institutional life (Lyle, 1959) may also explain the differences found by Schlanger and Blanchard. Better controlled studies are rare. Mein (1961) compared non-institutionalized Down's syndrome and non-Down's syndrome ratarded subjects of similar CA and MA and found that the noun percentage drop occurs later and is of a lesser extent in the language development of the Down's syndrome children. Also they use significantly less articles than their retarded peers but there was no difference in total verbal output. McCarthy (1965) employed the ITPA with non-institutionalized subjects matched for MA and CA. She found Down's syndrome children relatively more deficient in the automatic usage of grammatical rules.

It is not possible to draw conclusions on the basis of data collected so far. The existence of a slight difference in grammatical development favoring non-Down's syndrome children might be suggested as a future research hypothesis. However, additional controls should be undertaken. There are indeed several variables more specifically related to Down's syndrome than to other forms of retardation that might explain the differences. The studies mentioned above have relied on production tasks in assessing language development. But it may be that deficiencies in articulation and language expression mask the actual level of linguistic functioning in Down's syndrome children. A recent investigation by Cornwell (1974) supports the hypothesis of a disparity between receptive and performance aspects of verbal ability in these children. Therefore a proper investigation should take largely into account language comprehension. The familial environment of Down's syndrome children may be different in some respects. It is known that they tend to have older parents (about three Down's syndrome children in four are born to mothers above thirty years (Smith, 1960). They are detected earlier in life, a fact which may effect in an unknown manner such things as the familial environment and the expectations of the parents. It is also known that Down's syndrome children present a greater susceptibility to various illnesses whose occurrence may adversely affect their language development.

Developmental Delay or Specific Deficit in Language Development in Handicapped Children

One of the most recurrent themes in the literature on language development of handicapped children is the question whether this development is simply delayed or truly different from that of normal children. The delay-difference distinction originated in the cognitive domain where it has been refined by Zigler (1966, 1969, 1973). When the distinction is applied to language development, one usually considers that a difference theory is supported if it can be shown that retardates are inferior to normal children matched for mental age. If it is not the case, this is considered to be supportive for a delay theory. Our point of view is that the opposition between the two formulations is meaningless in the present state of knowledge. We do not see how it is possible to hold that, even for one given aspect of linguistic development, retarded are equivalent to younger normals without having carefully examined not only the products but also the underlying processes of linguistic functioning. In most cases, these processes completely escape our approach. This is true for retarded as well as for normal children. Moreover, the few studies that have concentrated on a careful examination of the processes in the retarded (the ITPA studies, Cromer's research, and a few others) indicate that they may not be identical for normal and retarded children. This is not unexpected. Contemporary psycholinguists (Bever, 1970; McNamara, 1972; Slobin, 1973; Clark, 1973a, 1973b) agree that language acquisition is largely based on cognitive development even if the two developments are different things. By definition, mentally retarded children differ from normals in cognitive development. There is no a prior reason for supposing that their linguistic development will not differ from that of normals. Additionally, it will be noted that relying on mental age as a basis for comparing normal and retarded does not guarantee that the subjects function cognitively in the same way. Mental age is based on IQ which is part of a psychometric approach that can yield information on the products but not on the processes of the intellectual functioning. The comparisons in terms of mental age are also largely artificial, especially as chronological ages must differ, because they do not take into account the experiential and personal differences between the subjects. The reasoning behind the expression "developmental delay" seems factitious.

A similar problem has arisen in the literature concerned with the linguistic problems of those normally intelligent children known as "deviant language users." The point was to define deviant language. Menyuk (1964), Lee (1966), and more recently Leonard (1972) have demonstrated that the concept of delay is appropriate for describing deviant language because deviant language users are more advanced than younger normals in some developmental aspects (for example, they use more standard English transformations than younger normals, after Menyuk, 1964) and because they plateau at certain stages of syntactic and grammatical morphological development. The same reasoning may be applied to the delay theory with mentally retarded children.

On the other hand, the available data concerning linguistic development in the retarded do not clearly support either of the two formulations. Depending on the aspect of the development that is considered, the data seem to favor a delay interpretation or a difference interpretation, but on the whole neither of the two formulations is clearly supported. The true story is probably more complicated. We suggest that we abandon these global and conceptually weak formulations lacking explanatory power and heuristic value and undertake a careful examination of the patterns of retarded linguistic development.

Critical Periods in Language Acquisition of Handicapped Children

According to Lenneberg (1967), language development is tied to maturational development and self-programmed learning. As puberty occurs, the brain behaves as if it were set in definitive ways, which physical maturation may be demonstrated in the structural, chemical, and electro-physiological changes that take place in the brain at that time. This definitive setting goes along with a decrease in the functional plasticity of the central nervous system for the demands of primary language acquisition with the consequence that "basic language skills not acquired by that time except for articulation remain deficient for life" (Lenneberg, 1967, p. 158). We will not discuss the general framework of Lenneberg's theory, namely the general biological prerequisite he sees for language development, nor the hypothesis of a critical period for language development in normal subjects. They will be taken for granted (although the second one clearly is not granted, as Lenneberg's evidence is only correlational). Rather we would like to argue that the way this hypothesis has been interpreted by Lenneberg himself and others for retarded children is simply one of several possible interpretations.

When he discusses the implications of his critical period hypothesis for language development in the retarded, Lenneberg reasons in the following way.

Retarded children presumably are delayed in maturational development. Around fourteen years, the maturational levels reached are different for normal and retarded but Lenneberg makes primary language acquisition process start freezing both for normal and retarded subjects. If he is right in associating maturational development and primary language acquisition then two things may happen to mentally retarded subjects. Either retardates reach the same maturational levels as normals later in life, in which case they should be able to show significant language development until that age level, or, they never reach the maturational levels of normal people. In other words if their central nervous system never freezes the way it does for normals around puberty, then they should exhibit capabilities for significant language development until physiological deterioration begins.

Comparative data on maturational development of the nervous system of normal and retarded children around puberty or after are not available. They would help to focus the problem in more specific terms but would not furnish the solution since the key point is not maturational development per se but interaction between maturational development, central nervous system setting and capacity for primary language acquisition.

Lenneberg and a few others have reported data in support of the hypothesis that retarded children's language development stops around fourteen years of age. In fact the data are suggestive at best. Lenneberg and his collaborators studied the language development of 61 Down's syndrome individuals ranging from 3 to 22 years and living at home (Lenneberg, Nichols, & Rosenberger, 1964). They reported that after 14 years, the language development of the subjects practically stopped. However, in view of the small number of subjects studied by age range, it seems that the number of individuals in the sample that were over age 14 could not have been sufficient to make a strong case. A few other data are still less substantiated. Cromer (1974a, 1974b) found that educationally subnormal children between CA 7.1 and 16.6 never made use of a response strategy posited to show a language-specific learning ability. As this strategy was found to be also lacking in normal adults and as many of the subjects were over 14 years, Cromer hypothesized that the strategy in question might be a feature of a critical period of language acquisition. This reasoning cannot serve to support Lenneberg's interpretation as it relies itself on the critical period hypothesis. Seitz, Goulding, & Conrad (1969) claimed to have found results congruent with Lenneberg's interpretation. They retested, on a free word association task, high and low MA retarded subjects who had been seen 30 months before by Keilman & Moran (1967), and found that the high MA group (mean CA:17.1; mean MA:11.5) did not show any significant change in its word association structures, whereas the low MA group (mean CA:15.3; mean MA:7.6) did. It is hard to understand how the authors have seen their results as supportive for Lenneberg's position as the low MA group that contained a majority of children above 14 years CA did show significant language development. They seem to have erroneously interpreted Lenneberg's position as bound to mental age, when in fact the hypothesis is concerned with chronological age. No data are available from other investigations. Although many studies did use retarded subjects over 14 years of age, they failed to report within group comparisons according to CA levels in the range that interests us here.

On the other hand, anecdotal support for the view that language development in retardates may continue after 14 years is supplied by a longitudinal study of Seagoe (1965). She reported noticeable linguistic development in a Down's syndrome child until 30 years, at which age he started deteriorating. The familial environment of the child, though atypic, as he lived with his father and a female teacher, was exceptional in that it pushed the child increasingly to new achievements.

The problem needs to be carefully investigated. So far, Lenneberg's position in regard to retarded children is virtually untested. The importance of the issue for language instruction is obvious. The outcome is indeed completely different whether the educator has only a few years between the diagnosis of mental retardation and the end of the critical period for instigating appropriate remedial techniques or whether the available age range for intervention is substantially longer.

SUMMARY OF SUGGESTIONS FOR FURTHER RESEARCH

(Supportative information and specific suggestions are found within the text.)

1. A linguistically oriented phonological description of speech of handicapped children is needed. Compton (1970) has described the speech of articulatory defective children of normal intelligence but none has been developed for mentally retarded, neurologically, emotionally, or acoustically handicapped children.
2. Because of problems of definition, classification etc. we do not have a good estimate of the incidence or prevalence of handicapped children, especially noninstitutionalized handicapped children. This is needed to facilitate program development and professional training. A national systematically organized and conducted investigation of the incidence and prevalence of handicapping conditions is needed.
3. There is little information available about the speech problems (stuttering, voice, articulation) of preschool-age children, especially within specific handicapping conditions such as mental retardation, acoustically handicapped, emotionally disturbed or neurologically handicapped.
4. We know very little about the relationship of speech problems to language problems in the preschool handicapped. If a child is not understood because of severe misarticulation difficulties, what is the relationship of this problem to his language development? What is the relationship between length, completeness, and grammatical complexity of sentences and articulatory ability in handicapped children?
5. The literature on morphological acquisition in mentally retarded children suggests that their sequence of acquisition of morphological skills and to some extent their ability to learn these rules in artificial situations may

be similar to nonretarded children. They seem to show a lesser ability to transfer or generalize morphological rules to new situations. This specific finding needs further investigation and we need to find out whether this phenomonon also is present in other areas of linguistic learning.

6. Research on the speech and language problem of children with hearing impairments of a relatively mild-moderate degree are almost nonexistent. These children have often gone unnoticed in the preschool years or later in the regular classroom and are just now being recognized. We need descriptions of their early language acquisition. We also need descriptions of early spontaneous language acquisition (signing) of deaf children with deaf parents. We know very little about the ultimate course of language development in handicapped children. Does the "delayed" child ultimately develop language skills consistent with peers?

7. The nature and the relationship of handicapped children's intellectual deficit and their verbal deficit needs to be further investigated.

8. There is a major assumption that has grown out of the study of normal language acquisition that competence grammars should be used for recording observations of performance. Should we follow this assumption with the handicapped? Dever (1971) and Engler, Hannah and Longhurst (1973) make alternate suggestions.

9. There is a real need for better descriptions of how different groups of handicapped children develops linguistically. What are the differences? What are the similarities? What are the explanations of the similarities and differences?

10. There is relatively little research on the communication development of handicapped children separate from their speech and language development.

11. There is a need for further investigation of language "deviant" children to see if their deviations are regular and appear to be rule governed.

Chapter 3. LANGUAGE ASSESSMENT

Language is an integral part of the total picture of the growth and development of the handicapped child. Language is frequently the most important single factor through which the handicapped child's growth and development are assessed. It is vital to the researcher, clinician, and special educator, that as accurate and representation of the child's language as possible be obtained.

This chapter is designed to review some of the issues, assumptions, and current approaches to language assessment. There are a number of very recent reviews of language assessment (Carrow, 1972; Emerick & Hatten, 1974; Irwin, Moore & Ramp, 1972; Siegel & Broen, in press; Yoder & Miller, 1972) that update earlier reviews (Bangs, 1968; Berry, 1969; Johnson, Darley & Spriesterbach, 1952, 1963; Spradlin, 1967).

We will review four major dimensions of the language and communication process. These include: the production and comprehension of the phonological system, the production and comprehension of the grammatical system including morphology and syntax, the production and comprehension of vocabulary and basic concepts, and the production and comprehension of language within interpersonal communication situations. These dimensions have been defined in Chapter 1. Table 3:1 demonstrates how the various assessment procedures have been classified by these dimensions. Descriptions of most of these procedures are contained in Appendices A-D. Before a discussion of specific test procedures there are several aspects of test standardization that warrant discussion.

ASSESSMENT PARADIGM

GENERAL DEVELOPMENTAL AND PERFORMANCE	Denver Developmental Screening Test (Frankenberg & Dodds) Y.E.M.R. Performance Profile for the Young Moderately and Mildly Retarded (DiNola, Kaminsky, and Sternfeld T.M.R. Performance Profile for the Severely and Moderately Retarded (DiNola, Kaminsky, and Sternfeld) T.A.R.C. Assessment System (Sailor & Mix) Meeting Street School Test (Hainsworth & Hainsworth)
GLOBAL LANGUAGE	Sequenced Inventory of Communication Development (Hedrick, Prather, and Tobin) Illinois Test of Psycholinguistic Abilities (Kirk, McCarthy, and Kirk) Utah Test of Language Development (Mecham, Jex, and Jones) Houston Test for Language Development (Crabtree) Receptive-Expressive Emergent Language (Bzoch & League) Communication Evaluation Chart (Anderson, Miles, and Mathney) Fairview Language Evaluation Scale (Boroskin) Preschool Language Screening Test (Hannah & Gardner) Verbal Language Development Scale (Mecham) Parsons' Language Sample (Spradlin) Slingerland Screening Tests for Identifying Children with Specific Language Disability (Slingerland) Reynell Developmental Language Scales (Reynell)

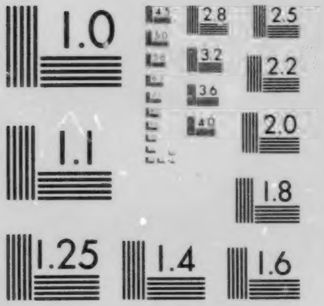
Table 3:1 (cont'd)

Preschool Language Scale (Zimmerman, Steiner, and Evatt)

Porch Index and Communicative Abilities in Children (Porch)

	PRODUCTION	COMPREHENSION
PHONOLOGY	Developmental Articulation Test (Hejna) Goldman-Fristoe Articulation Test Deep Test of Articulation Test Templin-Darley Articulation Test Photo Articulation Test (Pendergast, et.al.) Phonetic Analysis of Speech Sample (Compton) Fisher-Logemann Test of Articulation Predictive Screening Test of Articulation (Van Riper & Erickson) The Stephens Oral Language Screening Test Arizona Articulation Proficiency Scale (Fudala) Riley Articulation and Language Test Picture Articulation and Language Screening Test (Rogers Ohio Tests of Articulation & Perception of Sounds (Irwin) Laradon Articulation Scale (Edmonston)	Auditory Discrimination Test (Wepman) Children's Auditory Inventory (Stern) Test of Auditory Discrimination (Goldman, Fristoe, Woodcock) Schuell's Discrimination Test Test of Listening Accuracy in Children (Mecham, Jex, & Jones) Denver Auditory Phonemic Sequencing Test (Aten) Sound Discrimination Test (Templin) Composite Auditory Perceptual Test (Witkin et. al.) Lindamood Auditory Conceptualization Test Ohio Tests of Articulation & Perception of Sounds (Irwin) Auditory Memory Span Test (Wepman & Morency) Auditory Sequential Memory Test (Wepman & Morency)

MORPHOLOGY & SYNTAX	Northwestern Syntax Screening Test (Lee) Test of English Morphology (Berko) Exploration Test of Grammar (Barry-Talbot) Grammatical Closure Subtest (ITPA) Carrow Elicited Language Inventory The Stephens Oral Language Screening Test (Stephens) Picture Story Language Test (Myklebust) Picture Articulation & Language Screening Test (Rogers) Michigan Picture Language Inventory (Wolski & Lerea) Riley Articulation and Language Test Sentence Manipulation Tasks Analysis of Speech Sample Developmental Sentence Types (Lee) Developmental Sentence Scoring (Lee & Cantor) Indiana Scale of Clausal Development (Denver & Bauman) Linguistic Analysis of Speech Samples (Engler, Hanna & Longhurst) Co-occurring & Restricted Structures (Muma) Language Sampling, Analysis & Training (Tyack & Gottsleben) Evaluation of Grammatical Capacity (Menyuk)	Northwestern Syntax Screening Test (Lee) Ski-Hi Receptive Language Test (Longhurst, Briery, & Emery) Auditory Test for Language Comprehension (Carrow) Assessment of Children's Language Comprehension (Foster, Giddan, & Stark) Miller-Yoder Test of Grammatical Comprehension Composite Auditory Perceptual Test (Witkin) Comprehension Tests for Syntac- Constructions (Bellugi-Klima) Michigan Picture Language Inventory (Wolski & Lerea)


1.0
2.8
2.5
3.2
2.2
3.6
4.0
2.0
1.1
1.8
1.25
1.4
1.6

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Table 3:1 (cont'd)

VOCABULARY & BASIC CONCEPTS	Michigan Picture Language Inventory-Vocabulary Subtest (Wolski-Lerea)	Michigan Picture Language Inventory-Vocabulary Subtest (Wolski-Lerea)
	Analysis of speech samples (NDW-TTR)	Full-Range Picture Vocabulary Test (Ammons & Ammons)
	Picture Story Language Test (Myklebust)	Quick Test (Ammons & Ammons)
		Peabody Picture Vocabulary Test
		Beohm Test of Basic Concepts
		Basic Concept Inventory (Engleman)
		Assessment of Children's Language Comprehension (Foster, Giddan & Stark)
		Vocabulary Comprehension Scale (Bangs)

TEST STANDARDATION

Test Scores and Norms

Raw test scores have almost no meaning unless they are further interpreted in some fashion. To compute a percentage of correct items also adds very little information unless these scores are somehow compared with other children's scores on the same measure. When scores for larger groups of children are available it is possible to develop an arithmatic average or mean for a given measure. These average scores are usually referred to as norms or normative data.

One popular method of interpreting scores is to compute a percentile score. The 50th percentile conforms to the median for a particular sample. Thus a child whose score falls at the 81st percentile performed better than 80 percent of the children in the comparison sample. Sometimes percentile ranks which divide up the scores into blocks of 10, 20, or sometimes 25 are used. So a child may be reported to score in the upper quartile.

The use of age scores is a very popular procedure on many language assessment procedures. Usually the number of items passed or some measure of language at a particular age level in a normative sample is compared with the test child's performance. This method of interpretation usually produces a statement such as "His score conforms to the mean for three-year olds." This is a deceptively simple procedure. It assumes that the behavior of all three-year-olds is relatively invariant and that a single test score adequately describes an individual child's behavior.

Whereas some type of normative data are useful in interpreting test scores, there are a number of precautions that require discussion.

When norms are used methods of administering test procedures become critical. If different methods were used to collect the normative data than are used by the examiner it may be inappropriate to compare scores.

Care should also be exercised to be sure that specific characteristics of the child examined and those in the normative sample are similar. It may be just as inappropriate to compare scores of white middle-class children from rural Kansas with white middle-class children from New York City as it is to compare white middle-class children with Chicano children. Examiners are being increasingly encouraged to develop normative data that comform with their own geographic or cultural populations.

Normative scores are often reported along with some form of variability such as standard deviations. Often there are large differences among the language test scores of young children, that is, young children's language is inherently variable. Since there is often this variability the fact that the test child's score falls at a particular age line may not be particularly meaningful unless the score deviates from the norm significantly.

Reliability

Any language assessment procedure should produce similar results from one time to the next and for different examiners. Test-retest reliability or temporal reliability is a measure of a test to produce similar results after some critical period of time. When there are a relatively large number of sequentially arranged items on a test the author may report split half correlations. Usually odd-numbered items are compared with even-numbered items. Since adjacent items should test the same skill there should be a high correlation. Likewise when tests contain alternate forms these forms should produce high correlations. Interexaminer reliability is a measure of how well the scores of two or more examiners administering the same test under similar conditions.

Validity

A language assessment procedure is valid if it measures what it purports to measure. This is a difficult judgment to make when we are dealing with something as amorphous as language.

The usual procedure for determining validity of a particular test is to administer it as well as other similar tests to the same children. The scores on the comparison tests are then compared to see how well they are correlated. Most popular language test authors have not reported validity statistics for their tests.

Many of the authors of language tests will attempt to establish validity of their test by comparing teachers ratings with test scores. This method should be considered a relatively weak form of validity. Another popular form of reporting validity is to show that increasingly higher scores on a test are correlated with increasing chronological age. This also is a weak form of validity because so many other characteristics increase with chronological age. The Validity of any test should always be questioned.

PHONOLOGICAL ASSESSMENT

Phonological assessment can be divided into the assessment of two main processes, production and comprehension. More complete descriptions of the tests in these areas are given in Appendix B.

Production

Problems with speech sound production or articulation are the most common type of speech disorder in children (Powers, 1957a). There are several comprehensive reviews of articulation disorders in children (Carrell, 1968; McDonald, 1964; Milisen, 1954; Powers, 1957; Van Riper & Irwin, 1958; Winnitz, 1969).

Articulation errors are usually classified as three types: omission of sounds, substitution of one sound for another, and distortion of a sound. Severity of articulation disorder is classified by number and type of errors with omissions being a more severe problem than substitution and distortion being the least severe.

One of the real difficulties in articulation assessment in preschool children is that it is perfectly normal for preschool children to have difficulty with articulation and there is a tremendous range of normal for articulation skills. For example, the average three-year-old tested by Templin (1957) correctly articulated 93 out of 176 items and the standard deviation was 34 items.

Screening and Prediction

The purpose of screening is to find children who have significant articulation problems that are in need of intervention. The goal of screening is detection of children with problems but not necessarily an in-depth description of their problems. The screening should detect children with significant articulation problems but exclude children with articulation that is normal for their age. The screening procedure must be brief because usually the examiner will have a large group of children to screen.

There have been a number of descriptions of articulation screening programs that are appropriate for school-age children (Black 1964; Irwin, 1965; VanHattan, 1969). There have been relatively few procedures developed especially for the preschool child.

Emerick and Hatten (1974, p. 133) suggest four ways to screen the speech of a preschool child:

1. Observe him during free play, perhaps with other children. This procedure is very effective, but time-consuming.

2. Ask him questions. This involves too much talking on the part of the examiner, and some children are reluctant to answer questions

3. Have him repeat words or phrases. This, too, requires unnecessary talking on the part of the clinician, and the examiner's model tends to influence the child's speech and thus does not provide a typical sample. Also, children rapidly tire of being parrots.

4. Have the child name colors, count, and identify pictures or objects. This is the most common method used; it is easy, takes very little time, and children seem to respond well to the tasks.

Additionally, most of the formal tests of articulation also contain subgroups of items that are designed for screening purposes. For example, the Templin-Darley Tests of Articulation (1969) contain a 50-item screening device that was scientifically developed. Their complete articulation test contains 176 items from which 50 items that differentiated children with significant problems were chosen. The table of norms for this 50-item screening test permits comparison of the individual child's score with hundreds of other children of the same age. Templin and Darley (1969) describe their screening test as follows:

> The Screening Test consists of those fifty items which have been found to discriminate best between good and poor articulation of preschool and kindergarten children. The items include one vowel, one consonant-vowel combination, twenty-two single consonants (ten in the initial, eight in the medial, and four in the final position), twenty-two two-consonant clusters, and four three-consonant clusters. Responses for these items are elicited by the first fifty pictures, presented on the first nineteen cards, and are recorded in spaces 1 through 50 on page 2 of the Articulation Test form. The fifty items which constitute the screening test were selected on the basis of a study of the production of 113 speech sound elements by 160 preschool and kindergarten children in which three techniques of testing were used: spontaneous utterance in response to a picture, imitative utterance with the picture, and imitative utterance without the picture (Templin, 1947b). The 27 per cent of children with the highest total articulation scores made up the "good articulation" group and the 27 per cent with the lowest total articulation scores the "poor articulation" group. Through the use of the Lawshe Nomograph technique of item analysis (Lawshe, 1942), a "Discrimination-value," or D-value, was determined to identify those sounds which

> best discriminated between children with good and poor articulation. For any sound the D-value indicates the separation between the mean percentages of correct utterance by good and poor articulation groups in terms of the standard deviation of the total distribution; for example, a D-value of 2.5 for a particular sound indicates that the mean percentages of correct utterance for the two groups were separated by 2.5 standard deviations. Of the fifty most discriminating items which make up the Screening Test, twenty-one had D-values above 2.5 by all three testing methods, twenty had D-values of 2.0 or above, and none had a D-value of less than 2.0 by more than one method of testing.

Since most preschool children experience some difficulty with articulation it is sometimes difficult to judge which children will overcome their difficulty as they mature and which will need specific intervention to overcome their problems. Alternatives to predictive testing such as waiting until the second or third grade to work with children who show defective articulation or working with all preschoolers, kindergarteners or first graders that show difficulty with articulation are not acceptable.

There have been several attempts to develop useful predictive articulation testing procedures (Carter & Buck, 1958; Dickson, 1962; Farquar, 1961; Pettit, 1957; Reid, 1947; Snow & Milisen, 1954; Steer & Drexler, 1960; Van Riper & Erickson, 1968). Winitz (1969) has provided an extensive review of these studies. Only one of these procedures, Van Riper and Erickson's (1968) Predictive Screening Test of Articulation has been put into general use by speech clinicians. The purpose of this test is stated best by the authors:

> We wish to emphasize that the basic purpose for which the Predictive Screening Test of Articulation has been devised is to differentiate children who will master their misarticulations without speech therapy from those who, without therapy, may persist in their errors. More specifically, the PSTA may be used to identify, among primary-school children who have functional misarticulations at the first-grade level, those children who will--and those who will not--have acquired normal mature articulation by the time they reach the third-grade level.

Diagnostic Testing

After screening and predictive testing have identified which children are in need of intervention the next step is to conduct some diagnostic testing. The purpose of diagnostic testing is to carefully and systematically describe the child's articulation problems so that appropriate intervention can follow. Emerick and Hatten (1974, p. 142, 143) list some of the questions involved in this process:

> What sounds are in error? How many are produced in a defective manner? What type of errors does he have--omissions, substitutions, distortions? Where do the articulatory breakdowns occur in words--initially, medially, finally? Do the errors occur in all forms of utterance or only in rapid, connected speech?
>
> How does the client misarticulate? That is, what are the specific muscle movement patterns that produce the errors? Are there any obvious dysfunctions?
>
> How does his articulatory performance vary, and under what conditions does it vary? Does he improve when given a vivid visual and acoustic model to imitate? Does he have certain words or phonetic contexts in which he utters his defective sound correctly, or closely approximating normalcy?
>
> Why does he misarticulate? Are his deficiencies related to problems in discrimination, retention span, neuromuscular abilities, adequate speech models, stimulation, and motivation for good speech? If so, do these deficiencies perpetuate the articulation errors?

There are a number of formal diagnostic articulation tests available (Anderson, 1959; Bryngelson & Glaspey, 1962; Cypreansen, Wileg & Lasse, 1959; Edmonson, 1960; Fisher & Logemann, 1971; Fudala, 1970; Goldman & Fristoe, 1969; Ham, 1971; Hejna, 1963; McDonald, 1964; Pendergast, Dickey, Selmar & Soder, 1969; Templin & Darley, 1970). Many of these tests are described in Appendix B. There are several detailed descriptions of articulation testing procedures (Emerick & Hatten, 1974; Irwin, 1965; Johnson, Darley & Spriesterbach, 1963; Van Riper, 1963; Van Riper & Irwin, 1958; Winitz, 1969). The procedures for testing in most of these tests are quite similar. Most of them require the child to name some object or action in pictures and then the examiner scores the child's articulatory response. Most of these tests provide norms to judge a particular child's articulatory mastery against. Most experienced examiners would suggest that the Templin-Darley (1970) provides the best norms of any of the tests. Some of these articulation tests offer special features. For example, Fudala's (1970) Arizona Articulation Proficiency Scale features a method for scaling the degree of articulatory defectiveness. The Goldman-Fristoe (1969) is well known for its excellent stimulus pictures. The Fisher-Logeman (1971) has special procedures for determining the nature of the phoneme inadequacy and to determine if there is a commonality between error phonemes in production violation. It also allows the clinician to rate dialectal characteristics. McDonald's (1964) Deep Test of Articulation is designed to evaluate the clients' misarticulations in a systematic way and in all possible phonetic contexts. In this test the phonetic environment of a particular sound is manipulated to cause the sound to be articulated as it is preceded by each of the vowels and consonants and followed by a vowel, and as it is preceded by a vowel and followed by each of the vowels and consonants. The usual finding is that a child may misarticulate a sound in certain phonetic environments and not in others. This certainly is important diagnostic information.

A new approach to articulation assessment is represented by the work of Compton (1970) and a number of others (Albright & Albright, 1958); Corder, 1966; Crocker, 1969; Fleming, 1971; Haas, 1968; McReynolds & Huston, 1971; Weber, 1970). The major assumption of this approach is that a child's misarticulations are not random errors but rather are part of a logical and coherent pattern. The child's misarticulations represent a phonological system that is idiosyncratic. The diagnostic emphasis is on understanding the underlying pattern of the child's misarticulations. This approach obviously influences intervention, changing the approach for correcting one sound at a time to working with features within the phonological system.

Comprehension

Within the general area of phonological comprehension are several areas of assessment: auditory acuity, auditory attention and localization, auditory perception and discrimination, auditory memory, and auditory blending and closure.

Auditory Acuity

In Chapter 2 the profound language incapacity that significant hearing loss causes in children was described. Certainly in any child with significant language delay an assessment of auditory acuity should be conducted. It is beyond the scope of the present review to discuss these procedures. Several other sources have provided a description of these procedures (Davis & Silverman, 1970; Newby, 1972; O'Neill & Oyer, 1966). The procedures developed by Fulton and Lloyd (1969) offer especial promise in this area with severely handicapped and young "difficult to test" children.

Auditory Localization and Attention

Auditory localization and attention are the abilities of locating the source of sound and then focusing on it. Obviously these skills are very important to language acquisition. There are relatively few formal methods for assessing auditory localization and attention in young children. Examiners often observe a child for evidence of turning his head or directing eye contact to a sound source and then timing the length of orientation toward the sound. An informal procedure such as this was described by Streifel (1974).

To some extent localization also refers to the ability to localize to a specific sound within a field of other sounds. Some popular tests of auditory discrimination (Goldman, Fristoe & Woodcock, 1970, 1974; Mecham, Jex & Jones, 1969) test the child's ability to discriminate sounds within a background of noise. Goldman, Fristoe and Woodcock's (1974) Auditory Selective Attention Test assesses the child's ability to attend under increasingly difficult listening conditions. It can be used as an index of an individual's ability to listen to and understand a message in the presence of competing sound that is systematically varied in intensity and type (fan-like noise, cafeteria noise, and voice). As each subtest progresses, the signal-to-noise ratio goes from a positive to a negative value. Therefore, at the end of the test, an individual is actually listening to a test item that is of lesser intensity than the competing noise.

Auditory Perception and Discrimination

A child's ability to identify differences in sounds is obviously an important prerequisite to speech and language acquisition. Berry (1969) uses the terms perception and discrimination synonymously and for the purposes of this review these terms will be used synonymously. There are a number of auditory discrimination tests (Goldman, Fristoe & Woodcock, 1970, 1974; Lindamood & Lindamood, 1971; Locke, 1970; Mecham, Jex & Jones, 1969, 1973; Oliphant, 1971; Pronovost & Dumbleton, 1953, Saunders, 1973; Templin, 1957; Wepman, 1958, 1970).

A significant amount of research has been conducted utilizing Wepman's Auditory Discrimination Test (1958; revised 1970). Wepman (1960) has conducted numerous experiments relating speech sound discrimination to other variables. His data indicated a positive relation between low reading achievement, functional articulatory defects, and poor speech sound discrimination in a study conducted with second grade children. He tested a group of first and second grade children with the Auditory Discrimination Test and concluded that there was a significant relationship between poor articulation and poor speech sound discrimination and a less definite but significant relationship between poor reading ability and poor speech sound discrimination. He also hypothesized that there was a relationship between speech sound discrimination and intelligence.

Wepman has stated that adequate speech sound discrimination is not fully achieved until eight years of age although the degree of competence varies with individuals and some children acquire the skill much earlier. He indicated that remedial work regarding sound discrimination should not begin until after eight years of age or third grade.

The results of Schiefelbusch and Lindsey's (1958) study further supported the evidence relating poor speech sound discrimination and poor articulation. First and second grade students with normal intelligibility and a matched group with articulatory defects had significant differences in sound discrimination abilities. The maturational component of sound discrimination ability was also reported. The authors found the second grade normal speakers to have better speech sound discrimination than the first grade normals, however, the second grade speech defective group did not exhibit significantly higher discrimination scores than the first grade speech defective children.

Prins (1963) conducted a study with children with functional articulatory defects and a control group of normal speaking first grade students utilizing the Wepman Auditory Discrimination Test. He concluded that speech sound discrimination is a function of articulation and the total learning process. An interesting finding of the study was that the children who confused place of articulation during speech sound discrimination also experienced difficulty in discriminating minimal word pairs in which one sound was altered in place of articulation.

Christine and Christine (1964) conducted an experiment with a group of retarded children, a group of children with articulatory defects and a control group which investigated the relationship between oral language and reading. The study tested the hypothesis suggested by numerous researchers that poor speech sound discrimination is causative of poor articulation and reading retardation in children. The Auditory Discrimination Test was administered to all subjects. The data collected suggested the conclusion that poor speech sound discrimination is one etiological factor of functional articulation problems and reading retardation.

The relationship between language comprehension and speech sound discrimination was investigated by Marquardt and Saxman (1972) in kindergarten children with numerous misarticulations and kindergarten children with normal articulation. The Auditory Discrimination Test was administered to the children. Results of the study showed that the articulatory defective group performed deficiently on the discrimination test in comparison with the articulatory proficient group.

Sherman and Geith (1967) reversed the traditional method of assessing the relationship between speech sound discrimination and articulation ability.

They administered the Templin Speech Sound Discrimination Test (1957) to 529 children. The 18 children with the lowest scores on the discrimination test and the 18 children with the highest scores were then administered the Templin-Darley Test of Articulation. Significantly higher scores were achieved on the articulation test by the children superior in speech sound discrimination skill.

Travis and Rasmus (1931) analyzed speech sound discrimination in a group of university freshmen and elementary school students. Their results indicated that the students in both age groups with articulation errors tended to perform poorer in their ability to discriminate sounds.

Ewing (1930) tested children with congenital aphasia and concluded that the high frequency losses which many of the children exhibited prevented accurate discrimination of speech sounds at normal conversational intensity. He considered the loss responsible for their failure to develop speech.

Anderson (1949) found that subjects had a greater number of discrimination errors on the /s/ sound in contexts in which they misarticulated /s/ than in contexts in which they did not. Based on such evidence Winitz and Bellerose (1962) suggested that specific types of sound discrimination may be a function of specific articulation errors. Rather than poor speech sound discrimination subsequently affecting articulation proficiency, they hypothesized that the learning of an incorrect phonetic response may affect discrimination between the correct sound and the incorrectly learned sound.

The Templin modification (1943) of the Travis-Rasmus Speech Sound Discrimination Test (1931) was used by Zedler (1949) in a study designed to evaluate the effect of phonic training on speech sound discrimination and written spelling. The results warranted the conclusions that written spelling and speech sound discrimination abilities are significantly related and speech sound discrimination increased significantly with phonic training.

Schlnager and Galanowsky (1966) administered the Templin Speech Sound Discrimination Test (1957), the Boston University Speech Sound Discrimination Test (1953), the Wepman Auditory Discrimination Test (1958), and a nonsense syllable sound discrimination test to normal and mentally defective children matched for mental age. The normal children scored significantly better on all tests. The discrimination tests were significantly correlated with articulation in the retarded group, however, in the normal group only the Nonsense Syllable Test had significant, yet low correlations with articulation.

Mecham (1955) using his Picture Speech Sound Discrimination Test assessed the speech sound discrimination ability of mentally defective children. Following speech therapy the subjects improved in articulation, speech sound discrimination, auditory memory span, and average sentence length. The improvement was independent of IQ, however, the improvement in speech sound discrimination was not independent of chronological age.

Winitz and Bellerose (1963) concluded that speech sound discrimination tests may measure the learned equivalence and distinctiveness of speech sounds as well as developmental skills.

Thompson's (1963) data agreed with that of Wepman (1960). Based on results of her sample of second grade children she concluded that speech sound discrimination and intelligence are highly correlated with good reading abilities. She also agreed essentially with Wepman on the maturation of speech sound discrimination skills. In the second grade sample she used in the study 24% had inadequate speech sound discrimination. The percentage was much higher during the first grade.

In an experiment with mentally retarded children Gruber and Steer (1965) utilized the Templin Speech Sound Discrimination Test (1957). The results of the study indicated that there were no differences in speech sound discrimination abilities between retardates with adequate articulation and those with a low articulation index. No significant sex differences were found in the sample regarding speech sound discrimination abilities.

Winitz and Lawrence (1961) investigated the relationship between articulation and sound learning ability in 12 kindergarten children with good articulation and 12 children with poor articulation. Each child was asked to imitate three non-English sounds. No differences were found between the groups in sound learning ability.

No relationship between articulation proficiency and speech sound discrimination was found by Barnes (1932) in a group of university freshmen contradicting the data in the Travis and Rasmus study. He found no differences between the speech defective group and the superior speakers on the Travis-Rasmus Speech Sound Discrimination Test. A study conducted by Hall (1938) utilized the same speech sound discrimination test. She found no significant differences between functional speech defectives and normal speakers in their ability to discriminate between pairs of speech sounds. No relationship was found between the ability to discriminate and recognize the sounds in a complex auditory pattern and articulation proficiency.

There are almost no studies in the literature concerning Goldman, Fristor and Woodcock's (1970) Test of Auditory Discrimination or Mechan, Jex and Jones' (1973) Test of Listening Accuracy in Children. Table 3:2 compares Wepman's (1970) test with these two tests one 13 features. These three tests are the tests that

Table 3:2

Comparison of Characteristics on the GFW, TLAC and Wepman

		Wepman	TLAC	GFW
1.	Type of stimuli presentation:	quiet test	noise test	quiet and noise subtests
2.	Method or stimuli presentation:	oral	audio-recording (male)	audio-recording (female)
3.	Stimuli:	auditory	auditory and visual	auditory and visual
4.	Word characteristics:	phonetically balanced	not phonetically balanced	phonetically balanced
5.	Words equated for length:	yes	no	yes
6.	Word length:	1 and 2 syllable words	1, 2, and 3 syllable words	1 syllable words
7.	Discrimination task:	between 2 words	among 3 words	among 4 words
8.	Number of practice items:	5	6	3 (only on noise subtest)
9.	Number of test items:	40	86	60
10.	Response:	oral	pointing	pointing
11.	Vocabulary training:	not available	not available	64 item task
12.	Retest:	40 different word pairs	not available	not available
13.	Normative data:	5-8 years	kindergarten, first and second grades	3 years, 8 months to above 70 years

are most accessible to clinicians and that are the most standardized. The Templin Speech Sound Discrimination Test (Templin, 1957) and the Boston University Speech Sound Discrimination Test (Pronovost and Dumbleton, 1953) are sometimes used clinically although they are not commercially available and include incomplete normative data and reliability and validity statistics. The Oliphant Auditory Discrimination Memory Test (Oliphant, 1971) is a newly developed test which measures auditory memory as well as speech sound discrimination. The Lindamood Auditory Conceptualization Test (1971) assesses both auditory discrimination and the child's ability to determine the order of spoken sound patterns and the number of sounds in a stimulus. It will be discussed in the section on auditory closure.

As part of the current project, three speech sound discrimination tests were compared by administering each of them to eighteen 3, 4, and 5 year-old preschool children. The tests evaluated were the Test of Listening Accuracy in Children by Mecham, Jex, and Jones (1973), the Goldman-Fristoe-Woodcock (1970) Test of Auditory Discrimination, and the Auditory Discrimination Test by Wepman (1970). The conclusions of this experiment will now be summarized.

The Wepman was considered the best speech sound discrimination test of the three evaluated for screening purposes provided the subjects knew the concepts "same" and "different". The test could also be useful with subjects who did not understand these concepts if they were instructed to repeat the items after the examiner. The Wepman was selected as the best test for a screening instrument primarily due to the time required for test administration. Another advantage of the test was that it required no visual, speech or reading abilities on the part of the subjects.

The examiner should be thoroughly familiar with the word pairs and method of presentation prior to test administration in an attempt to assure that the stimuli will be presented identically with the same rate, inflection, and intensity.

The Wepman maintained the children's attention better than the TLAC but not as well as the GFW particularly with seven children who repeated the word pairs after the examiner although they had not been told to do so. The main disadvantage of the Wepman was the same-different method of responding.

The GFW was regarded as more suitable as a diagnostic instrument to be used with children who performed poorly on a screening test and further evaluation was desired. The GFW required approximately twice as long to administer as the Wepman. The longer time needed for administration of the GFW would be profitable with children suspected of having speech sound discrimination problems. The more complete analysis of the children's abilities obtained from the GFW would justify the length of time needed for test administration.

The GFW was more effective in maintaining the children's attention probably because the tasks on the test changed reducing the monotony for the children. It also supplied the most complete information on the children's speech sound discrimination abilities since it assessed performance in a quiet and noise background. It was the only test to provide a method to analyze the children's errors beyond converting the test scores to percentiles and a rating.

The TLAC was the easiest test to administer since the instructions, the practice items, and the test items were presented from an audio tape. The length of the test, the inability to differentiate which item caused the discrimination difficulty for failed items, the extent of the auditory memory required and the number of vocabulary words used outweighed the advantages of good pictures and the tape-recorded presentation of the test.

The TLAC was least effective in maintaining the children's attention. They often attended to approximately half of the test items and had difficulty concentrating on the last section of the test which reduced their overall scores and consequently their percentile rankings. This resulted in scores not indicative of their actual speech sound discrimination ability. The children's task on the TLAC remained the same for all 86 test items which was ineffective in maintaining their attention. We felt it would be more profitable to indicate the letter (A,B,C) of the item the children selected since this would provide information on which item was selected instead of the correct item should a detailed analysis of the scores be undertaken.

An important disadvantage of each of the three tests was that the children were only required to discriminate words presented by others. Schiefelbusch (1958) suggested that children may show excellent discrimination for the e errors of others but have difficulty recognizing their own errors. Another disadvantage of no active participation by the children was out inability to determine if they were attending to the tasks.

A more complete speech sound discrimination test should assess subjects' discrimination abilities for speech as they hear words from others, as they produce them themselves, and as they evaluate them silently (Schiefelbusch, 1958). Sanders (1972) provided a simple yet complete measure based on principles similar to these which were suggested by Aungst and Frick (1964). Her evaluation consisted of four sections. In the first section the child matched two extraneously produced sounds presented by the examiner by responding "same" or "different" to the stimuli. In the next step the child matched an external sound presented by the examiner to one produced by himself through imitation. The third section assessed the subject's ability to match an external sound to an internal criterion. The subject indicated whether the examiner's production of single words was correct or incorrect. The final section required the child to match an internally produced sound with an internal criterion. The child produced the sound and determined if his production was accurate or inaccurate. Except for the Phoneme Perception Task (Locke, 1970) no formal tests or normative data which included the last three criteria are available.

Auditory Memory

Memory is often divided into two types of short term and long term memory. The emphasis here will be on short term memory for individual speech sounds, digits, and words.

Another important prerequisite to is the ability to remember important characteristics of auditory stimuli. The child has to remember individual sounds as well as pattern of sounds. Even though these appear to be important skills for the acquisition of speed and language there is very little literature to draw definite conclusions. Winitz (1969) concluded that there were not enough data to make a definitive conclusion as to the relationship of these skills to speech and language acquisition.

There is no formed procedure for testing memory for individual speech sounds. Often when examiners test auditory memory abilities it is in the form of digit span. The Auditory Sequential Memory Subtest of the Illinois Test of Psycholinguistic Abilities (Kirk, McCarthy & Kirk, 1968), the digit span subtests of the Stanford Binet and the Weschsler intelligence tests and the Auditory Sequential Memory Test (Wepman & Morency, 1973) use digits to test auditory memory. The instructions of these tests usually suggest that the examiner present a digit every one-half second to which the child has to respond by repeating the digits. The norms for this test suggests that a child should be able to remember in sequence a digit for each year of chronological age up to about six or seven digits which approximates adult ability. There is some critism of digit span tests because it is difficult to see the direct relevance of this skill to speech and language acquisition.

The Auditory Memory Span Test (Wepman & Morency, 1973) tests the child's ability to remember single syllable words in progressively increasing series. The child's responses are scored and then these scores can be compared with normatic data. This test, simply because of the nature of the task, seems to be more relevant to speech and language acquisition.

The Goldman, Fristoe, Woodcock (1974) Auditory Memory Tests assesses three aspects of short term memory: recognition memory, memory for content, and memory for sequence. The Recognition Memory Test measures the child's ability to recognize an auditory event which has occurred in the immediate past. A "yes" or "no" answer indicates whether or not the child had previously heard the word during the test administration. The Memory for Content Test measures the ability to recognize the elements in an auditory event without regard for the sequence of those elements. After an auditory presentation of words, the child is shown pictures of the named elements plus two additional pictures and points to the two which were not named. The Memory for Sequence Test measures the ability to remember the order of the elements in an auditory event. After listening to a series of words, the child is asked to arrange

Table 3:3

Linguistic Features Across Three Language Tests

According to Test Question

Linguistic Feature	MY	Carrow	NSST
Prepositions			
under	3, 4	45	1
on	3, 4	44	3
in	5, 6	46	3
beside	5, 6	-	-
behind	-	-	1
between	-	48	-
at the side of	-	47	-
in front of	-	49	-
Nouns			
Singular	24, 25	69	6
Plural	24, 25	66, 67, 68	6
Tense			
Past	31, 32	74	8
Pres. Prog.	30, 31	64, 72, 73	12
Future	30, 32	76	12
Pres. Perf. Prog.	-	77	-
Pres. Perf.	-	75	-
Noun/Verb Inflections			
is	28, 29	70	5
are	28, 29	71	5
Noun/Verb Agreement			
Singular	26, 27	91, 92	6, 15
Plural	26, 27	-	6, 15
Pronouns			
he	18, 20	60	2
she	19, 20	61	2
they	18, 19	59	-
we	-	65	-
her	15, 16	-	10
them	15, 17	-	-
him	16, 17	-	-
his	-	63	-
their	-	-	10

Table 3:3 (cont'd)

Linguistic Feature	MY	Carrow	NSST
Active Reversibles			
Subj./Obj.	1, 2	78, 79	9
Passive Reversibles			
Subj./Obj.	39, 40	80, 81	18
Affirm./Negative			
is	13, 14	85	4
is not	13, 14	86, 87, 98	4
has/doesn't have	9, 10	-	-
can/can't	11, 12	-	-
neither/nor	-	88	-
no + noun	-	94	-
Possessive	7, 8	-	11
Modification			
object	33, 34	96	-
subject	35, 36	97	-
obj./subj.	37, 38	-	-
Indirect Object	-	95	20
Reflexives	41, 42	-	7
Impers. & Interrog.			
Pronouns	-	82	13, 16
who	-	84	13
what	-	-	16
where	-	83	-
when	-	-	19
this	-	42	19
that	-	43	-
these	-		
Question Reversal	-	-	14, 17
Lexicon	-	1-10	-
nouns	-	29, 1-10, 30	-
color	36, 37, 34	11-13	-
quality	-	14-20	-
quantity	-	21-28	-
adverbs	-	39-41	-
Derivational suff.	-	50-58	-

Table 3:4

Chi-square Analysis of the Proportion of Correct Response on the Three Tests by Linguistic Feature

Linguistic Feature	X^2	df	Linguistic Feature	X^2	df
under	3.097	3	are	*50.42	3
on	3.097	3	sing. n/v agree.	*14.654	5
in	3.097	3	pl. n/v agree.	*67.098	3
sing. noun	*75.35	3	she	*29.936	3
plural noun	2.534	5	he	*44.462	3
past	*169.26	3	they	4.210	2
pres. prog.	*25.39	5	sub./obj. act. revers.	*3.998	4
future	*324.89	3	obj. mod.	1.947	2
is	*185.55	3	subj. mod.	*6.634	2
sub/obj pass.	*33.992	4	ind. obj.	*48.369	1
neg/aff is	*7.227	3	reflexive	*8.817	2
neg/aff is not	*6.316	5	who	*7.360	2
possessive	*4.44	2	what	*64.309	1

*Significant at the .05 level.

the pictures in the order in which the elements were presented. The child's score on these three tests is then compared with normative data.

Auditory Blending and Closure

These are two somewhat related skills. Auditory blending is usually tested by having the child repeat words back to the examiner which have been presented to him with each sound separated by small time intervals. There are at least two formal tests of sound blending including the Sound Blending Subtest of the Illinois Test of Psycholinguistic Abilities and the Sound Blending Test of the Sound Symbol Tests (Goldman, Fristoe, & Woodcock, 1974). Van Riper also presents an informal sound blending test. Auditory closure is usually tested by presenting words to the child that have missing sounds or syllables. He must supply the missing part(s) to close the word. The Auditory Closure Subtest of the Illinois Test of Psycholinguistic Abilities and the Sound Recognitions and Sound Analysis Subtests of the Sound Symbol Tests (Goldman, Fristoe & Woodcock, 1974) measure this skill.

MORPHOLOGICAL AND SYNTACTIC ASSESSMENT

Evidence suggests that the acquisition of language skill follows a relatively set sequence (Brown, 1973). This knowledge has made it possible to construct tests that assess the child's morphological and syntactic structures at various stages of development. Appendix C contains descriptions of many of these tests.

Production

Much of the literature on the assessment of production deals with the analysis of spontaneous speech samples (Longhurst, 1974). Many of the global language tests, which are discussed later, have subtests that deal with morphological and syntactic production. There are a few informal imitation tasks (Fraser, Bellugi, & Brown, 1963; Kaczaj & Maratsos, 1975; Slobin & Welsh, 1973) and one formal imitation test (Carrow, 1974). The expressive portion of Lee's (1971) Northwestern Syntax Screening Test is also relevant here. There are a number of informal and formal tests of morphological development (Berko, 1958; Berry & Talbot, 1966; Dever, 1967; Dever & Gardner, 1967; Kirk, McCarthy & Kirk, 1968).

Traditional Analysis Procedures

McCarthy's (1930) early work served as the first step of many of the later studies of morphological and syntactic assessment. She relied heavily on analyses of the child's spontaneous speech as a criterion of language development. Others (Day, 1932; Davis, 1937; Johnson, Darley & Spriesterbach, 1963; Templin, 1957) who followed her developed and refined her techniques. The mean length of response with it's many variations and various ways of assessing structural complexity were the hallmark of these traditional approaches. Usually at least 50 responses are elicited from the child and then various analyses are computed.

Mean Length of Response (MLR). Introduced by Nice (1925), mean length of response (MLR) is an objective measure of a child's linguistic maturity. Brown (1973) suggested that MLR is a stable measure and is better than CA for predicting development. To obtain this measure, the examiner finds the total number of words for a given number of consecutive responses and divides by the number of responses. A second version is the mean length of the five longest responses (M5L). The examiner calculates the average number of words in a child's five longest responses. Davis (1937) suggested this measured maximum linguistic ability. Another variation is the number of single words (N1W). Since one's speech becomes more complex with age, one-word responses should decrease as a function of age. MLR is sensitive to changes in many variables. Socio-economic status, IQ, stimulus material, and conversation with adults and peers are a few mentioned by McCarthy (1930) as affecting MLR. MLR is reasonably reliable. Among children of the same age, it is stable. Darley and Moll (1960) found that 50 responses yielded a relibility coefficient of .85. Validity, however, is questionable. Shriner (1967) found that MLR was not correlated with several psychological scales of language. MLR reveals relatively little about the structure of responses, although increasing MLR should be correlated with increasing linguistic complexity.

Structural Complexity Scores. McCarthy (1930) developed procedures for looking at structural complexity. Day (1932) used these procedures for her classic study of language in twins. Davis (1937) also used these procedures. These were relatively simple procedures that classified responses into categories such as: functionally complete but structurally incomplete, simple sentences with and without phrases, complex, compound, or elaborated sentences. Incomplete responses were also categorized. Williams (1937) and Templin (1957) both developed early methods of quantifying these categories. Templin (1957) assigned weights to the various categories to develop a structural complexity score (SCS). Darley and Moll (1960) suggested that SCS values were less reliable than MLR.

Length-Complexity Index(LCI)

The Length-Complexity Index (Miner, 1969) is a modified combination of McCarthy's (1930) MLR and Templin's (1957) SCS. Thus, both length and complexity are considered together according to a numeric weighting system. A language sample is collected from the child. Usually 50 sentences are analyzed although Griffith and Miner (1969) have shown that as few as 15 produce reliable results. Various noun phrases and verb phrases are given points along with additional points for specified morphological and syntactic structures. The total of these points is then divided by the number of sentences to produce the LCI. Barlow and Miner (1969) found that test-retest reliability for LCI was quite high.

Recent Linguistic Analysis Procedures

Recent clinical research has begun to focus on specific structural or linguistic aspects of children's language production (Dever & Bauman, 1974; Engler, Hannah, & Longhurst, 1973; Lee, 1966; Lee & Canter, 1971; Muna; 1973; Tyack & Gottsleben, 1974). These procedures require that the examiner elicit, record, segment, and then analyze, classify or score the speech of children.

Developmental Sentence Types (DST). Lee (1966) applied findings obtained in several developmental psycholinguistic studies of normal language acquisition to develop a procedure for diagnosing delayed language development. Lee's purpose was to investigate the observation that the "language delayed" child was not just slower in syntactic development but was proceding in a bizzare manner. A speech sample was collected and analyzed from a "normally developing" and a "clinic" child. Lee concluded, based on the comparison of the two children, that her developmental sentence types (DST) method of classifying sentences showed marked differences in her two samples. Her analysis demonstrated not only slower development in the "clinic" child but failure in production of certain types of syntactic structures. Lee (1974) provided a somewhat updated version of DST designed to analyze the speech of children speaking mostly in pre-sentences.

Linguistic Analysis of Speech Samples (LASS). Engler, Hannah, and Longhurst (1973) presented a linguistic analysis of speech samples (LASS) procedure which allowed the speech clinician to elicit, record, segment, and analyze the spontaneous speech of children within a relatively standardized test situation. This eclectic approach utilzed contrastive analysis using a combination of concepts borrowed from slot-filler (tagmemic), immediate constituent, and elementary transformational grammar approaches of current linguistic theory. The authors posited five basic sentence-types for English, with the construction contained in the verb phrase as the criterion for classification. The categories were: 1) sentences characterized as "equational" by using copulative or linking verbs; 2) sentences employing intransitive verbs; 3) sentences containing "object-taking" verbs; 4) sentences requiring a "transitive verb of the senses"; and 5) passive sentences (although transforms of type (3), they are listed separately for purposes of frequency count). Using Chomsky's (1965) theory, the authors posited that by applying the linguistic processes of expansion, conjoining, and transformation any English sentence can be generated, and/or reduced to one of or a combination of the five basic sentence types. The authors suggested that the LASS procedure provided a simplified inventory and a relatively quick analysis and gave valuable insights into the preparation of a clinical program.

Indiana Scale of Clausal Development (ISCD). Dever and Bauman (1974) presented the Indiana scale of clausal development (ISCD) based on a slot-filler (tagmemic) grammar and designed to classify the spontaneous utterances of children who were CA 18-40 months. The scale was not intended to be indicative of any specific stages within clausal development nor was it an attempt to describe clausal development in terms of the development of children. It was an attempt at classifying language performance patterns. The scale was conceived of as being a scale of development within clauses and clause-types (intra-clause) and not as a scale which indicated generalized development across clauses (inter-clause). The expected outcome was that children would exhibit regular advances within clauses, but irregular development across clauses.

Developmental Sentence Scoring (DSS). Lee and Canter (1971) developed a clinical procedure, developmental sentence scoring (DSS), intended to estimate the status and progress of children currently undergoing language training in a clinic. Lee and Canter predicted that by analyzing a child's spontaneous, tape-recorded speech sample, a clinician could estimate if a child had generalized rules sufficiently to use them in verbal performance. The DSS procedure gave weighted scores to a developmental order of different "parts of speech", specific morphological or syntactic constructions. Lee and Canter's objectives were to provide guidelines for planning lessons and estimating the status and rate of progress in children treated in a speech clinic. Lee (1974) has updated the DSS procedure by reweighting some of the structures.

Language Sampling, Analysis and Training (LSAT). The basic purpose of LSAT is to describe the morphological and syntactic rules the child has applied in the sample. The authors have designed a number of specially constructed forms to facilitate this process. The analysis includes a count of words and morpheme mean, assigning the sample to a linguistic level on the basis of this mean. The child's forms and constructions are then sorted into categories which serve as a baseline for training. These categories are then used to determine training sequences.

Co-Occurring and Restricted Structures (CORS). This procedure is designed to identify and describe which grammatical systems a child is in the process of acquiring. The first step is chosing target structures or systems. Any grammatical structure or system can be chosen. Examiners should select a target structure on the basis of a preliminary examination of representative language samples. In this way, they can direct their focus to those grammatical systems in which a child has difficulty. The probabilities of appropriate selection can be significantly increased in this procedure because the grammatical systems are integrated. Operationally, the selection of one target will, at some point, be relevant to other potential targets because the underlying systems are integrated. Generalization from one target to another is expected to happen. Following selection of a target structure, all utterances containing the target are separated out for study. These utterances should be grouped by sentence type. Within these types, systematic descriptions of co-occurrences can be made. And the patterns of restricted and adult structures for these co-occurrences describe the level of attainment. Grammatical co-occurrence pertains to those structures that co-exist in structural relationships to each other. Co-occurring structures are any that have a contextual relationship to a target structure. A pattern of co-occurrence for a target structure would indicate the contextual effects of certain adjacent structures, sentence frame types, levels and types of modification, etc. Restricted structures show partial learning. Child utterances typically do not contain errors; they are simply the result of grammatical rules. A child has limited or restricted knowledge in comparison to an adult. Accordingly, children's utterances are restricted structures rather than errors. Restricted structures identify which systems and particular dimensions of systems in which mastery is in progress. The type of restricted structures identifies the status of progress.

Imitation Tasks

Imitation of sentences is quite often used as a source of information about child language development (McNeill, 1970; Menyuk, 1964, 1969; Lenneberg, 1967. There is still considerable controversy about the extent to which imitation involves linguistic processing (Fraser, Bellugi, & Brown, 1963; Kuczaj & Maratsos, 1975; Slobin & Welsh, 1973). Ervin (1964) and McNeill (1970) suggested that the grammar of a child's spontaneous speech and the grammar of his imitations are not different. It is probably inappropriate at this time, however, to assume if a child correctly imitates a particular grammatical structure that that structure should appear appropriately in his spontaneous speech.

Carrow's (1974) Elicited Language Inventory (CELI) was designed to provide a standardized method of obtaining production data on a child's grammatical system. A child's imitations of a wide variety of sentence constructions and grammatical morphemes are compared with normative data from specific CA groups.

Morphological Test Procedures

The purpose of morphological testing is to examine the expressive ability to provide morphological inflections. The test stimuli may consist of actual words as in the grammatic closure subtest of the ITPA or nonsense items as in Berko's (1958) original procedure or in Dever's (1967) modification of Berko's procedures or in the Exploratory Test of Grammar (Berry & Talbot, 1966). It has been demonstrated that in testing EMR children, higher scores are obtained when real items were used (Dever & Gardener 1967). The supposed advantage in using nonsense stimuli is that the child's response will not be imitated or biased by previous exposure to the vocabulary items. There are usually no formal scoring procedures for these types of tests with the exception of the grammatical closure subtest of the ITPA. Dever (1967) found that the type of test used by Berko does not predict the occurrence of errors in the free speech of EMR children.

Comprehension

Most of the formal tests that have been constructed have attempted to assess the comprehension of morphological and syntactic features by children. These comprehension tests are often used as predictors of later productive language skill development. This is reasonable since it is a widely held belief among developmental psycholinguists that passive control (comprehension) precedes active control (production) of the same linguistic features (McNeill, 1966).

A test designed to probe comprehension skill should: (a) require minimal or no productive language from the child and (b) accurately reflect the child's specific comprehension strengths and weaknesses. This second requirement of an effective comprehension test is probably the most difficult to assure. If a child misses an item, it is virtually impossible to know whether the child lacks the knowledge to respond correctly, or whether he is distracted by a drawing or by a poorly constructed stimulus item. If, on the other hand, the child passes an item, the examiner may be fairly certain that the child has correctly comprehended (Carrow, 1968).

There are several tests on the market which purport to accurately test syntax and morphological comprehension skills, and yet they vary greatly among themselves in terms of structures tested, presentation of items, scoring, and interpretation. The discerning examiner should evaluate each of these areas before using a test as a diagnostic tool.

Three Comprehension Tests

As part of the current project we conducted a study designed to evaluate and compare three well-known comprehension tests by administering them to eight preschool children. The tests compared were the Test of Auditory Comprehension of Language (Carrow, 1968, 1973); the Miller-Yoder Test of Grammatical Comprehension, Experimental Edition, (Miller & Yoder, 1975); and the Northwestern Syntax Screening Test (Lee, 1969).

Test for Auditory Comprehension of Language. Carrow (1973) stated that the two functions of her test were to measure the auditory comprehension of structure, and to allow the examiner to determine the areas of linguistic difficulty. The test consists of a set of 101 plates each containing from one to three line drawings designed to represent vocabulary items, grammatical categories, and morphological and syntactic structures. A correct response consists of the child correctly pointing to a word, phrase, or sentence presented by the examiner. Each item is presented in a specific manner, and tag phrases such as "show me" are not used unless specifically indicated. Each correct response counts as one point and the total score is the total number of items passed. The raw score is divided into subscores for broad category scores. Percentile scores and language ages can be derived for comparison with norms ranging from 3.0 to 6.11 years of age.

Miller-Yoder (1975) Test of Grammatical Comprehension (MY). The MY test was intended to measure children's grammatical comprehension. The test consists of 42 sentence pairs to be identified by pointing in response to stimulus sentences. There are 42 plates, each plate containing 4 line drawings, 2 foils and 2 pictures identifiable from test sentences. Responses are recorded on the data sheet, which are then transferred to a Comprehension Test Results Form which indicates the categories that were missed. No raw score is obtained, and thus no percentile score or language age may be derived.

Northwestern Syntax Screening Test (NSST). The NSST by Lee (1969) was intended to test not only a child's comprehension of grammatical features, but also his production of them and to compare the two. For this reason, the NSST consists of 40 sentence pairs with 20 to be identified receptively and 20 to be repeated productively. Since for the purposes of our study the expressive portion of the test was not appropriate, discussion will be limited to the receptive section. It consists of 20 plates, each of which contains 4 pictures (again 2 foils and 2 pictures identifiable from test sentences). A correct response consists of the child pointing to the appropriate pictures one at a time as the examiner repeats the two sentences. Each of the test pairs yield perfect scores of 2, scores of 1 if one sentence is missed, and 0 if both are missed. Norms range from 3.0 to 7.11 years of age, and are expressed on charts from which a child's percentile score may be determined.

Comparison of Linguistic Structure in the Three Tests. Table 3:3 compares the linguistic features across the three language tests according to test item. This table attempted to include all of the linguistic features found in the MY, the Carrow, and the NSST, and to indicate which of the tests probed each feature. Certain observations are evident in examining this chart. For instance, the MY did not test any constructions using impersonal pronouns; the NSST did not test the use of adjectives; and the Carrow did not include a probe for object pronouns. Although all three tests included items which were not included in the other two, the Carrow proved to be especially complete. For example, it included a lexicon of words which appeared later in the test to assure that a child did not fail an item due to lack of vocabulary.

Chi-square Analysis. A summary of a chi-square analysis comparing the proportions of correct responses on the three tests by linguistic feature is presented in Table 3:4. The chi-square analysis revealed that there were significant differences in the proportion of correct answers among twenty of the twenty-six linguistic features common to all three tests. Theoretically, if the child possessed a certain linguistic feature, he should be able to correctly answer any of the equivalent test items. These results indicate that children did not correctly answer comparable items from these tests. In fact, out of the 26 linguistic features, only 6 showed similar results. Thus, it is difficult to determine whether or not a child truly possessed a linguistic feature and whether or not a specific test is valid.

Analysis of Variance Comparing Language Ages and Percentiles. The language age in months and percentiles for the Carrow and the NSST are presented in Table 3:5. Analyses of variance were used to compare the language age means and the percentile means for the Carrow and the NSST. The MY was not included in this statistical analysis because the test did not provide language age or percentile scores. The results of the analysis of variance indicated significant differences between the Carrow and the NSST on language age at the

Table 3:5

Subject Scores and Means for Language Age and Percentile Scores on the Carrow and NSST

Child	Language Age in Months		Percentile	
	Carrow	NSST	Carrow	NSST
A	71	75	95	92
B	77	36	93	8
C	64	63	79	75
D	82	76	99	90
E	64	36	68	10
F	73	49	78	30
G	78	72	97	77
H	39	43	57	51
Mean	68.50*	56.25*	83.25**	54.13**

*Significantly different at the .10 level.

**Significantly different at the .05 level.

.10 level of significance and on percentile scores at the .05 level of significance. This result again brings into question the validity of the tests.

VOCABULARY AND BASIC CONCEPTS

As was suggested in Chapter 1, the child may be thought of as having two overlapping vocabularies; the productive vocabulary or the words he uses in his speech and the receptive vocabulary or the spoken words he can comprehend. Almost all of the words in the productive vocabulary should be in the child's receptive vocabulary but all of the words in the receptive vocabulary need not be in the productive vocabulary. Most of the attention in assessment of vocabulary has been directed to receptive vocabulary and the procedures for assessing productive vocabulary are less structured and ambiguous. Many of the so-called "basic concept" tests are simply vocabulary tests designed to assess a specific set of vocabulary.

Production

Type-Token Ratio (TTR)

The number of different words (NDW) used in a 50-response sample provides an indication of a child's productive vocabulary. Templin (1957) found increased NDW as age increased, but she found no significant differences between the sexes. This measure is sometimes difficult to interpret, because it could be measuring a child's tendency to talk rather than the size of his vocabulary. The type token ratio (TTR) is the ratio of the number of different words in a sample to the total number of words. It is a measure of word redundancy in speech. Johnson (1944) reported four variations of TTR: (1) Overall TTR which was just described; (2) Mean segmental TTR in which the sample is broken into equal parts and TTRs for these parts are averaged; (3) Cumulative TTR curve in which segmental TTRs are plotted along a curve; and, (4) Decremental

TTR curve in which a TTR is found for each group of 100 words in a sample, with the restriction that no 100-word group shall include any previously encountered type in the numerator of its TTR. A minimum sample of 300 words is recommended.

The Carroll (1964, p.54) type token ratio (CTTR) is the number of different words in a sample divided by the square root of twice the number of words in the sample. This measure is supposedly independent of sample size.

Standardized Tests

There are few standardized tests of productive vocabulary. The vocabulary subtest of the Michigan Picture Language Inventory attempts to test productive vocabulary. The Auditory Association subtest of the ITPA also attempts to test productive vocabulary. In this subtest the child is given a pair of sentences like:

A bee has a hive;

A man has a _______.

This task seems to require more than just using the word in speech.

Comprehension

There are a number of standardized tests of the words a child comprehends or understands (Ammons & Ammons, 1958; Bangs, 1975; Boehm, 1971; Dunn, 1965; Engleman, 1967; Foster, Giddan, & Stark, 1969; Kirk, McCarthy & Kirk, 1968).

Of the two most widely known tests of receptive vocabulary (Ammons & Ammons, 1958; Dunn, 1965) the Peabody Picture Vocabulary Test (PPVT) is the most popular. The PPVT consists of 150 plates with four line drawings per plate. The child is required to point to a single picture in response to a stimulus word. The word represented by the plates becomes increasingly more difficult through the test. Scoring results in a language age, vocabulary intelligence quotient and a percentile rank. The PPVT intelligence quotient is often misused. The PPVT should not be used as a quick intelligence test especially with language handicapped children. It is a reliable and valid measure of children's comprehension of single words.

The Assessment of Children's Language Comprehension (ACLC) by Foster, Giddan, and Stark (1969) tests for comprehension of 50 single words in five critical semantic categories: agents, objects, actions, attributes, and relations. It also tests for comprehension of two, three, and four critical word utterances made up from the original 50 test items. Obviously auditory memory as well as receptive vocabulary are being tested when multi-word stimuli are used. An unpublished test, the Ski-Hi Receptive Language Test by Longhurst, Briery, and Emery (1974) was patterned after the ACLC. One hundred vocabulary items divided into the same five critical semantic categories and further subdivided into categories such as zoo animals, clothing and eating utensils are tested. Again, these same words in two, three and four critical element utterances are also tested.

There are three tests which might be classified as basic concept tests, (Bangs, 1975; Boehm, 1971; Engleman, 1967). They measure the comprehension of specific vocabularies. The most popular of these tests is the Boehm Test of Basic Concepts. It tests the comprehension of 50 basic concepts such as *few*, *away from*, and *separate*. It can be administered to small groups of children and is especially useful for young school-age children. Bangs' (1975) Vocabulary Comprehension Scale tests many of the same concepts but is appropriate for children from about two to age six.

GLOBAL LANGUAGE TESTS

The global language test by definition should test most of the levels of language in both the production and comprehension processes. This type of test serves a useful purpose in that it gives an overall picture of a child's language problem. More specific tests or procedures can then be used to emphasize areas of deficiency that are revealed on the global test.

Appendix A contains a more complete description of many of the global language tests. After a brief discussion of these tests we will compare and evaluate global language tests that are particularly appropriate for preschool children.

Illinois Test of Psycholinguistic Abilities

The ITPA (Kirk, McCarthy, & Kirk, 1961, 1968) was the only global test available for several years. There has been a great deal written about the strengths and weaknesses of the ITPA (Paraskevopoulos & Kirk, 1969). Certainly one of the contributions made by the ITPA is the fact that it produces a profile of psycholinguistic abilities that allow a comparison of the expression and reception processes.

Informant-Interview Scales

The Verbal Language Development Scale (VLDS) (Mecham, 1958) is an extension of the communication portion of the Vineland Social Maturity Scale. The VLDS is administered to the child's mother or another reliable informant. Although the age range is from one month to 15 years, it is most useful for providing a rough language-age-equivalent for the child below three years of age. Bzoch and League's (1971) Receptive-Expressive-Emergent-Language Scale is a similar test in that it is administered to a reliable informant. It is basically a series of questions about expressive and receptive language acquisition over the language age period from birth to 36 months. It yields a receptive quotient, an expressive quotient and a composite or combined quotient. The REEL is especially useful in guiding the choice of questions in a parent case history interview. Since the age range is from 0-36 months, the test can often be administered to the parents of older handicapped preschool children because these children may be two to three years delayed. The Communication Evaluation Chart (Anderson, Miles, & Matheny, 1963) may also be administered to an informed adult. The CEC is divided into nine age levels from three months to five years. The CEC is useful for making a quick survey of the child's language functioning to determine if it is below normal limits.

Parsons Language Sample (PLS)

The PLS (Spradlin, 1963) is not commercially available and is not used often by language specialists. The PLS subtests include tests of tacting, echoic, intraverbal, echoic gesture, comprehension, intraverbal gesture and manding.

Preschool Language Tests

There are several global language tests that may be used to assess the language abilities of preschool children. These tests include the Hannah-Gardner Language Screening Test (Hannah & Gardner, 1974), the Houston Test for Language Development, Part II (Crabtree, 1963), the Utah Test of Language Development, (Mecham, Jex, & Jones, 1967), the Preschool Language Scale, (Zimmerman, Steiner, & Evatt, 1969), the Reynell Developmental Language Scale (Reynell, 1969), the Michigan Picture Language Inventory (Wolski, 1962), and the Sequential Inventory of Communication Development (Hedrick, Prather

& Tobin, 1976). Descriptions of these tests are included in Appendix A.

As part of the current project, three of these preschool tests were compared by administering each of them to eight 3, 4, and 5-year-old children. The tests evaluated were the Hannah-Gardner Language Screening Test by Hannah and Gardner (1974), the Houston Test for Language Development, Part II by Crabtree (1963), and the Utah Test of Language Development by Mecham, Jex & Jones (1967). A comparison of the common test items is presented in Table 3:6.

The mean language ages in months for the eight children on the Utah, Houston, and Hannah-Gardner were 53.50, 52.89, and 45.25 months respectively and within these means there was a significant difference ($F = 2.68$, $df = 1, 2$, $p < .10$). Application of a least significant difference procedure at the .10 level revealed that the means for the Utah and Houston were not significantly different but the means for these two tests were significantly different from the mean on the Hannah-Gardner. Thus the Hannah-Gardner produced a significantly lower language age than the other two tests. We also made some subjective judgements of each of these tests.

Due to the well-organized presentation of test items and the use of few extraneous stimulus materials beyond crayons and paper, the Utah was the easiest of the three procedures to administer. In addition, responses were well defined so there were few subjective judgments that were required of the examiner. The Utah was, however, the least effective of the three tests in maintaining the children's attention during adminsitration. The entire test was scored during the test presentation and the language-age-equivalent was easily computed following completion of the test. This test gave the examiner the most complete language age in years and months. The Utah did not provide any interpretation of test results or a summary of the child's performance on the test. This made it difficult for the examiner to determine

Table 3:6

Comparison of the Common Test Items on the Hannah-Gardner, Utah, and Houston

Hannah-Gardner	Utah	Houston
Copying geometric shapes	Copying geometric shapes	Imitating geometric shapes
Counting - receptive	Counting - receptive graphic object counting	Counting - expressive serial and object counting
Colors - receptive	Colors - receptive and expressive	Colors - expressive
Auditory memory - receptive and expressive 2 sets single syllable words and 2 commands	Auditory memory - expressive digits and sentences	Auditory memory - expressive repetition of 1 word (3 syllables) to 14 words (15 syllables)
Prepositions - receptive		Prepositions - receptive
	Vocabulary - receptive and expressive objects	Vocabulary - expressive objects action, attributes
	Body parts - receptive	Body parts - receptive

the areas where further assessment or training should be concentrated.

The Houston provided the most comprehensive review of the child's test performance and the greatest amount of information on his strengths and weaknesses. The Houston also included the elicitation of a sample of the child's oral language. Although this was valuable information, the examiner was required to score these sections following the test session. The response guidelines were well presented and provided for consistent scoring between children. Underlining the specific test question in the test manual would simplify the stimulus presentation. The language age obtained from the raw score was expressed in yearly age levels.

The Hannah-Gardner was the most effective of the three tests in maintaining the children's attention. Test questions were adequately presented but response guidelines were needed in greater detail for objective, consistent scoring. The stimulus materials included with the test required more extensive manipulation by the examiner than those for the Utah and Houston. All responses were scored by the examiner following presentation of each item and percentile scores computed at the completion of the test. Percentile scores were derived for each section in addition to a total percentile. The child's test performance was assessed by examining the responses in the test sections and the percentile scores.

COMMUNICATION ASSESSMENT

There are really no formal tests of the child's ability to use speech and language skills in interpersonal communication situations. The development of interpersonal communication skills in nonhandicapped and handicapped children has already been reviewed in Chapters 1 and 2. A number of methods have been devised to study the development of communication skills among children which are also relevant to communication assessment. In many of these, the task is defined as a communication situation involving a speaker and a listener who can hear, but not see each other. Both participants have an array of objects pictures. In the Krauss and Glucksberg (1969) "stack the blocks" game, the listener has a set of four blocks, each of which has an abstract design imprinted on it. The speaker, on the other side of a screen takes a single block from a dispenser and has to describe it in such a way that his partner can stack the corresponding block on a peg. Communication is measured in terms of how accurately the listener selects the appropriate blocks from the array, based on the speaker's descriptions. In general, the data indicate that the children become more adept on the task with age, and that they are generally better as listeners than as speakers in this communication game (Glucksberg, Krauss and Higgins, 1975). Longhurst (1972) and Longhurst and Berry (1975) have used this same procedure to study the communication behaviors of retarded children, and Longhurst and Siegel (1973) created conditions of "communication disorder" with adults by introducing acoustic distortion in the signal presented to listeners, and then noting the effect on the speaker's messages. Hanson (1972) used much the same technique with young normal children, except that he substituted familiar objects for the nonsense designs used by Krauss and Glucksberg (1969).

There are a number of variants of this basic procedure, many of which are described in the chapters by Glucksberg, Krauss, and Higgins (1975), Rosenberg and Cohen (1967) and Rosenberg (1972). In all of the variations of the basic procedure, the approach is limited to only one aspect of communicative behavior--the effective transmission of referential information that will allow for the identification of a stimulus within some array. Communication in its broadest sense clearly involves more than reference, but this aspect has been studied most extensively.

Flavell and his colleagues (1968) also devised a series of communication tasks, to test the development of "role-taking skills" in children. These studies are closely allied to Piaget's concepts of egocentrism and role-taking ability. The tasks are generally very inventive and not nearly so standardized as those used by Rosenberg or Krauss and Glucksberg. The basic strategy is to devise a communication situation in which the listener has some peculiar characteristic that has to be noted by the speaker if adequate communication is to ensue. For example, the listener may be wearing a blindfold, or placed at a peculiar vantage point in the situation, or may be fully familiar vs. unfamiliar with the situation, etc.

The procedures in the role-taking and communication studies have almost exclusively focused on the child's sensitivity to his listener's needs. Another important aspect of communication is the child's ability to use language to serve his own needs. This seems to have been studied much less extensively.

Another research approach to interpersonal communication that is relatively unstructured has yielded interesting results in studies involving mothers and their children (e.g. Broen, 1972), and assemblies between pairs of retarded children (Rosenberg, Spradlin, and Mabel, 1961) or of normal adults and retardates of varying verbal abilities (Siegel, 1967). In these assembly studies, the general intent has been to determine the extent to which the verbal behavior of each participant is influenced by the behaviors and characteristics of the other participant. This "interpersonal approach" has been summarized in a general way by Siegel (1967, p.112):

Briefly, this framework suggests that whenever A and B are together in a social situation the behavior of each is at least partially a function of the responses and characteristics of the other. This approach seems especially cogent in the study of communication disorders since speech events are almost always interpersonal, involving both a speaker and a listener. Even if A is a speech clinician and B a child coming for correction, not only does the clinician modify the behavior of the child, but the child also exerts some influence over the behavior of the clinician. A child who is very taciturn may evoke different verbal stimulation from the clinician than does a more responsive, talkative child, especially if the clinician is not particularly sensitive to the dynamics of social interactions. It is a common occurrence in university speech and hearing clinics, where a child is likely to have several different student clinicians during the course of his therapy, to find a statement in the child's folder at the beginning of each therapy period indicating that he is grossly unintelligible, and a statement at the end of that period suggesting that intelligibility is greatly improved. It is unlikely that the child's speech skills fluctuate so radically and so periodically from academic quarter to quarter. It is much more probable that the significant changes have occurred in the perceptions of the student clinician.

Similar processes may be at work during assessment. Several years ago, I was involved in extensive articulation testing of children in an institution for retarded children. Though fairly standardized test procedures were used, it soon became apparent that the test administration took considerably longer with some children than with others. As a matter of fact, the children who were most rapidly hustled in and out of the room were those who had bizarre physical anomalies, were drooling, or were not toilet trained.

Despite the fact that language and communicative functions are inseparable in the real environment, both formal and informal assessment procedures have generally ignored the child's ability to use his language skills in interpersonal situations. There are virtually no tests and few experimental methods designed explicitly to inquire into these skills. The methods that have been described here may be useful to the clinician who is interested in the communicative functions of language. To the extent that effective communication is one of the principle goals of therapy, techniques like these may help measure and document the progress of clients who are enrolled in communication therapy.

SUMMARY OF SUGGESTIONS FOR FURTHER RESEARCH

(Supportative information and specific suggestions are found within the text.)

1. Methods of testing hearing acuity and auditory perceptual skills in severely handicapped or young "difficult to test" children developed by Fulton & Lloyd (1969) and other similar procedures need to be refined and made available to practicianers so that a wider population may be tested.
2. The promising approach to phonological assessment suggested by Compton (1970) and others needs to be developed and standardized so that it can be utilized more readily by clinicians.
3. There are few formal tests for assessing localization to a significant sound and auditory attention to that sound. Since these skills are very important to language handicapped children, more formal procedures that can be used by practicianers should be developed.
4. Better methods of "differential diagnosis" among specific handicapping classifications such as deaf and congenitally aphasic need to be further developed.
5. The validity of sampling in general and specifically the validity of standardized tests needs investigation. If a child scores correctly on a particular item on a standardized test will the structure tested necessarily be part of his productive system and vice versa?
6. Our conclusion is that decisions about utterance or sentence classification in spontaneous speech measures like DST, DSS, LASS and ISCD are difficult and sometimes arbitrary. What is the reliability of these decisions? What can we do to improve reliability?

7. There is a question of usefulness of particular procedures or tests. What is the reliability and validity of a particular measure of complexity when used for a specific purpose?
8. There is a tremendous need to standardize descriptions, measures and tests. Should utterances be measured in mean length in words or morphomes? Does it make a difference the way a sample is elicited? Does it make a difference how you segment a sample? Does it matter that a test standardized on normals is administered to handicapped children in three sessions rather than one? We need to develop better definitions. What is an utterance or sentence?
9. We need to know what measures correlate with what other measures. Why do some measures we assume are related only weakly correlate if they correlate at all?
10. Practicianers need research that compares the use of different assessment procedures or tests to help evaluate their relative strength or weaknesses.
11. There is a real need to develop methods of assessing interpersonal communication skills in children.

Appendix A. GENERAL DEVELOPMENTAL, PERFORMANCE AND GLOBAL LANGUAGE TESTS

DENVER DEVELOPMENTAL SCREENING TEST (DDST)

GENERAL DEVELOPMENTAL

Authors: William K. Frankenburg
Josiah B. Dodds
Alma W. Fandal

Publisher: Ladoca Project Publishing
Foundation Inc.
E. 51st Ave. & Lincoln St.
Denver, Colorado 80216

Cost: Manual, workbook, score forms - $6.25

Age Range: Birth to 6 yrs.

Date: 1967

Administration Time: 15-20 minutes

Purpose: Designed to meet the need of having a simple useful tool to aid in the early discovery of children with developmental problems.

Description

The test assesses personal-social, fine motor-adaptive, language and gross motor skills. These are called sectors.

Procedure. Explain to the parent that the child will not be expected to do all that is asked of him. Calculate child's age and use that age to draw an age line. Draw the line through the four sectors of the test form at the child's exact age. Spaces between age marks shown represent 4 weeks until age 24 months. From 24 months to 5 years the space between marks represents 3 months. In drawing the age line if the child is born 2 weeks or more prematurely subtract the number of weeks early from the age of the child and draw the line at this adjusted age. Write the number of weeks adjusted. Suggested order of testing follows the test form however it is flexible. Whatever order is chosen the items must be given in an exact manner. Begin each sector with items the child is able to perform easily. Praise the child for his efforts, even though he fails to pass the item. Remove all test materials except the ones being used. Begin each sector with items below age of the child and work up to his age, test upward until he has three failures in that sector. All items through which the age line passes should be given. Make certain the child has several passes to the left of any failure. Each sector should have at least 3 items which are passed and 3 items which are failed. Allow only three trials to perform each item before a failure is scored.

Scoring. Items are scored on the bar on the test sheet at 50%. Items are scored P for pass, F for failure, R for refusal or N.O. for no opportunity. A delay is any item which is completely to the left of the age line on the score sheet. Delays should be emphasized by coloring in the right end of the bar of the delayed item. The test result is considered abnormal if 2 sectors have 2 or more delays or if 1 sector has 2 or more delays plus 1 other sector has 1 delay. The test is considered questionable if one sector has 2 or more delays or 1 or more sectors have 1 delay.

Standardization. The DDST was standardized on 1.036 normal Denver children between ages 2 weeks and 6.4 years. The selected population was a cross section of group characteristics for the Denver population according to 1960 census data.

7. There is a question of usefulness of particular procedures or tests. What is the reliability and validity of a particular measure of complexity when used for a specific purpose?

8. There is a tremendous need to standardize descriptions, measures and tests. Should utterances be measured in mean length in words or morphemes? Does it make a difference the way a sample is elicited? Does it make a difference how you segment a sample? Does it matter that a test standardization on normals is administered to handicapped children in three sessions rather than one? We need to develop better definitions. What is an utterance or sentence?

9. We need to know what measures correlate with what other measures. Why do some measures we assume are related only weakly correlate if they correlate at all?

10. Practicianers need research that compares the use of different assessment procedures or tests to help evaluate their relative strength or weaknesses.

11. There is a real need to develop methods of assessing interpersonal communication skills in children.

Norms. Each test item calculated. A percent-passing curve was computed for each item. On this curve the age at which 25%, 50%, 75%, and 90% of the children who passed an item was determined. Norms available for boys or girls, white or blue collar workers.

Reliability. Test-Retest Reliability agreement over a week interval was 95.8%. Average intersession percent agreement was 90. Examinations were observed through a one-way screen by an independent observer, and it was noted a number of disagreements were due to children behaving differently from one time to the next.

Validity. A high degree of agreement between the DDST rating and the quotients of the Stanford-Binet and Bayley were achieved. Grouping the normal and questionable DDST ratings and all quotients of 70 and above together resulted in co-positivity of 0.73, a co-negativity of 0.92, 7.2 percent overreferrals and 2.95 percent underreferrals. Ninety-five percent agreement between some items passed by parental report. No problem in pass or fail on the basis of parental report.

Comments. The test is designed for use by people who have had no special training in psychological testing. It is easy to give and score. It provides the opportunity to ask the parent if the child's performance was typical of his ability and behavior at other times. General overall interpretation can be discussed with the parent to see if the child is developing these skills. The back of the test form has a place for observations. On the same test form you can retest using a different color of pencil. If the score is abnormal, questionable or untestable the suggestion is to rescreen 2-3 weeks later.

Y.E.M.R. PERFORMANCE PROFILE FOR THE YOUNG MODERATELY AND MILDLY RETARDED

GENERAL PERFORMANCE

Authors: Alfred DiNola
Bernard Kaminsky
Allan Sternfeld

Publisher: Reporting Service for Children
563 West View Avenue
Ridgefield, New Jersey 07657

Cost: $21.00--complete class kit
$ 5.00--sample kit (one manual, one booklet, one chart)

Date: 1967

Purpose: Evaluate moderately and mildly retarded children as to strengths and weaknesses in daily living activities.

Description

The Y.E.M.R. Performance Profile identifies performance level of the child in a wide variety of daily tasks as observed by the teacher. The Profile graphically indicates child's performance, points out deficient areas, and shows areas of readiness for new learning.

This Profile measures ten major areas which are based upon the developmental abilities necessary for the growth and adjustment of the young mentally retarded child to his social and intellectual environment before and after he enters the public schools. The ten areas are:

a. social behavior
b. self-help
c. safety
d. communication
e. motor skills
f. manipulative skills
g. perceptual and intellectual development
h. academics
i. imagination and creative expression
j. emotional behavior

These major areas are subdivided totalling 100 items for the overall profile.

The child is rated on each item according to his own performance and competes only against himself.

The child is evaluated according to seven descriptive levels of performance ranging from 0 (non-performance) to 6 (highly desirable performance). These points are totalled for each area and for the overall profile to determine a habilitation level (development of an individual's potential). This habilitation level is converted to a Habile Index which provides a numerical indication of the child's performance in daily learning and living tasks.

A cumulative record of annual observations may be used to report the child's progress over a number of years.

The profile provides a good basis for intervention and presents a visual display of the child's progress.

T.M.R. PERFORMANCE PROFILE FOR THE SEVERELY AND MODERATELY RETARDED

GENERAL PERFORMANCE

Authors: Alfred DiNola
Bernard Kaminsky
Allan Sternfeld

Publisher: Reporting Services for Children
563 Westview Avenue
Ridgefield, New Jersey 07657

Cost: $15.00 -- Complete class kit
$ 5.00 -- Sample kit (one manual, booklet, chart)

Date: 1968

Purpose: To evaluate a retarded child according to six major areas of daily living activities.

Description

The T.M.R. Performance Profile was developed by classroom teachers as an evaluative instrument for identifying pupil performance based upon teacher observation. This scale evaluates the child's performance in a wide variety of daily living activities found in the curriculum. The T.M.R. Performance Profile investigates six major areas:

a. social behavior
b. self-care
c. communication
d. basic knowledge
e. practical skills
f. body usage

Each area is sub-divided into 40 specific items. The child is rated on each item according to his performance and competes only with himself.

This profile is designed to assist the teacher in the following areas:

a. to record observations
b. to view scores in a graphic form
c. to identify areas of needs and competence for a child
d. to plan remedial techniques
e. to review periodic development
f. to maintain a cumulative record

The following descriptive levels are used in scoring:

X--behavior not observed
0--non-performance, no display of awareness
1--minimal performance
2--limited acceptability
3--a realistic goal
4--performance above the goal

These numbers are totaled for each area and also for the entire profile. These total number of points are referred to as habilitation levels. Habilitation is defined in the manual as the process of developing the potential of an individual. Number of points possible is 960. The Habilitation levels are transferred to an index chart in the manual to obtain a Habile Index which indicates the present performance of an individual. Yearly observations may be obtained and recorded on a comparative chart to evaluate a child's progress over a period of time.

THE TARC ASSESSMENT SYSTEM GENERAL PERFORMANCE

Authors: W. Sailor
B.J. Mix

Publisher: H & H Enterprises, Inc.
P.O. Box 3342
Lawrence, Ks., 66044

Cost: $5.95

Age Range: variable

Date: 1975

Administration time: variable

Purpose: To provide a short-form behavioral assessment of the capabilities of retarded or otherwise severely handicapped children on a number of skills related to education.

Description

The TARC inventory provides scores for self-help, motor, communication, and social skills. The self-help area involves toileting, washing, eating, and combing. The motor area involves small muscle, large muscle, and pre-academic skill development. The communication subtest involves both expressive and receptive language skills. And finally the social domain involves the behavioral aspects of the individual.

The results are placed both on a score sheet, which is used to determine raw scores, and on a profile sheet, which is used to formulate educational goals and instructional objectives.

Comments. This system is most appropriate for specialists wishing to obtain an overall assessment of the very young or severely impaired child's development.

MEETING STREET SCHOOL

GENERAL DEVELOPMENTAL

Authors:	T. Hainsworth D. Hainsworth	Publisher:	Eric Doc. Reproduction Service LEASCO Information Products Inc. Drawer 0, Bethesda, Maryland 20014
Cost:	$12.00	Age Range:	5.0 - 7.5 years
Date:	1973	Administration time:	20 minutes

Purpose: To screen kindergarten and first grade children who do not have the requisite language and visual-perceptual-motor control to absorb the symbolic information of the traditional school curriculum.

Description

The test briefly samples a child's input, integration, and output skills in all of the three subtests; 1) motor patterning, 2) visual-perceptual-motor, and 3) language.

Norms. Included in the manual are normative tables for the three subtests and the total Meeting School Street Screening Test scores at half-year age levels between 5.0 and 7.5 years.

Reliability and Validity. The MSSST has been used in large scale screening programs and is found to be a good predictor of children who will encounter academic difficulty.

Comments. This test can be administered by nonprofessional as well as professional. It is a relatively new test but should be good for early identification of children with learning disabilities.

SEQUENCED INVENTORY OF COMMUNICATION DEVELOPMENT

GLOBAL LANGUAGE

Authors: D.L. Hedrick
E.M. Prather
A.R. Tobin

Publisher: University of Washington Press
Seattle, Washington 98105

Cost: $95.00

Age Range: 4 months to 4 years

Date: 1976

Administration time: approx. 30 minutes

Purpose: To evaluate the communication abilities of normal and retarded children.

Description

There are two major sections of the communication model; expressive and receptive. The expressive section includes three types of expressive behaviors: 1) imitating, 2) initiating, and 3) responding; also two distinct areas of expressive measurement of linguistic behaviors: 1) length, and grammatic and syntactic structures of verbal output; and 2) articulation. The receptive section includes behavioral items that test sound and speech discrimination and awareness, and understanding.

Comments. This is a global test in the true sense of the word. It is a very broad, comprehensive test that allows for observation at all levels of language in both production and comprehension.

ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES(ITPA) GLOBAL LANGUAGE

Author: Samuel A. Kirk,
James J. McCarthy
Winifred D. Kirk

Publisher: Western Psychological Services
12031 Wilshire Blvd.
Los Angeles, California 90025

Cost: $57.50

Age Range: 2-10 years

Date: 1968

Administration time: 45-60 minutes

Purpose: To delineate specific abilities and disabilities in children so that remediation and intervention can be undertaken.

Description

The ITPA attempts to determine specific areas of communication difficulty as well as being a molar test of intelligence. The ITPA was originally based upon a theoretical model of communication (Osgood 1957). The model recognizes three dimensions of cognitive abilities:

1) Channels of Communication. These are the routes through which communication flows. The channels may include various combinations of sensory input and response output. The major modes of input are auditory and visual; whereas those of output are vocal and motor. Although there are many combinations possible, the ITPA incorporates only the auditory-vocal and the visual-motor channels.
2) Psycholinguistic Process. There are three main processes related to the acquisition and use of language. These are a) the receptive process; b) the expressive process; and c) an organizing process which involves the internal manipulation of concepts and linguistic symbols.
3) Levels of Organization. There are two levels of organization postulated by the ITPA. These are a) the representational level, which requires the complex mediating process of utilizing symbols which carry the meaning of an object; and b) the automatic level in which the individual's habits of functioning are less voluntary but highly organized and integrated.

This theoretical model of communication has been used to generate ten discrete tests and two supplementary tests for the purpose of assessing specific abilities and disabilities in children. To obtain a complete understanding of the ITPA it is necessary to describe the 12 individual subtests.

Functions Tested at the Representational Level

A. The Receptive Process
   1. Auditory Reception. This is a test to assess the ability of a child to derive meaning from verbally presented material. Fifty short, direct questions requiring only yes or no answers are included.
   2. Visual Reception. This assesses the ability to derive meaning from visual symbols. The child is shown a stimulus picture for 3 seconds and is told, "See this." Then a second page of pictures, one of which is conceptually similar to the stimulus, is shown. Then the child has to "Find one here."

B. The Organizing Process
   1. Auditory-Vocal association. Assesses the ability to relate concepts presented orally. Sentence completion is the technique which requires the subject to complete 40 short analogies.
   2. Visual-Motor Association. Assesses the child's ability to relate concepts presented visually. A single stimulus picture is surrounded by four optional pictures. The child is asked which of the optional pictures goes with the central picture.

C. The Expressive Process
   1. Verbal Expression. Assesses the ability of the child to express his own concepts orally. The child is shown four familiar objects and is asked, "Tell me about this."
   2. Manual Expression. Assesses the ability to use manual expression in response to being asked "Show me what we do with a _____." The child is to pantomine the response.

Functions Tested at the Automatic Level

A. Closure (the ability to fill in the missing parts in an incomplete picture or expression)
   1. Grammatic Closure. Assesses the child's ability to make use of the redundancies of oral language in acquiring automatic habits for handling syntax and grammatic inflections. Each verbal item consists of a complete statement followed by an incomplete statement to be furnished by the child.
   2. Visual Closure. Assesses the child's ability to identify a common object from an incomplete visual presentation.
   3. Auditory Closure. This is the first supplementary test which assesses the child's ability to fill in missing parts which were deleted in auditory presentation and to produce a complete word. In this test the child is asked "What am I talking about-tele / one" There are 30 such items.
   4. Sound Blending. This is the second supplementary test which assesses the organizing process at the automatic level in the auditory-vocal channel. The sounds of a word are spoken singly at half-second intervals and the child is asked to say what the word is. Thus he has to synthesize the separate parts of the word and produce an integrated whole.

B. Sequential Memory. (the ability to reproduce a sequence of auditory or visual stimuli)
   1. Auditory Sequential Memory. Assesses the child's ability to reproduce from two to eight digits.
   2. Visual Sequential Memory. Assesses the child's ability to reproduce sequences of nonmeaningful figures from memory. The child is shown each sequence of figures for five seconds and then is asked to put corresponding chips of figures in the same order.

These twelve tests are designed to isolate defects in (a) three processes of communication, (b) two levels of language organization, and/or (c) two channels of language input and output. Performance on specific subtests should pinpoint psycholinguistic abilities and disabilities.

Norms. There are four tables in Appendix A of the Examiners Manual. They include norms for: (1) securing the Psycholinguistic Age (PLA) for each subtest; (2) securing the Scaled Score for each subtest; (3) securing the composite Psycholinguistic Age (Composite PLA) for the 10 basic subtests; and (4) securing Stanford-Binet Mental Age Estimates. The norms were derived from the responses of approximately 1,000 average children between the ages of 2-10. This sample of children was selected as being of average performance on traditional measures of intelligence, school achievement, and socioeconomic status. In addition they all had intact motor and sensory development.

Scores. The Raw Scores are obtained directly from the tests and are not readily interpretable. They can be used for group comparisons and correlational analysis. To make comparisons between subtests the Raw Scores must be transformed into more meaningful scores. The composite Psycholinguistic Age (Composite PLA) was derived from the Composite Raw Score (of the 10 basic subtests). It indicates the psycholinguistic age of a child who achieves that Raw Score. It is a global score like a mental age and is, so to speak, an overall index of psycholinguistic abilities and disabilities. A Composite PLA which is significantly above or below the child's Chronological Age classifies that child as above or below average in psycholinguistic development. The Psycholinguistic Age for each of the 12 subtests can similarly be derived from the Raw Score (for that particular subtest). It can be interpreted in the same manner that the Composite PLA is. Scaled Scores are transformations of Raw Scores such that at each age and for each of the 12 subtests the mean performance of the referral group is equal to a score of 36 with a standard deviation of 6. Scaled Scores provide a more versatile means of comparing the child's performance from subtest to subtest than do the PLA's. All of these scores can be determined and recorded on the Summary Sheet and the Profile of Abilities graph located at the back of each score sheet. To determine whether or not a child has substantial discrepencies in abilities, a point of referance is established. For this purpose the overall ability of the child is used. The overall performance is expressed in terms of Mean Scaled Score, or the Median Scaled Score. The extent of the difference between the SS of a subtest and the Mean of Median SS reflects the degree of strength or weakness in that psycholinguistic function. The following guidelines are presented:

1. Differences between a subtest SS and the Mean or Median SS of ±6 should not be considered an indication of a special ability or disability.
2. Differences between the Mean or Median SS and the subtest SS of ±7, ±8, or ±9 are considered as borderline discrepencies.
3. A difference between the Mean or Median SS and the subtest SS of ±10 or greater is considered a substantial discrepency.

UTAH TEST OF LANGUAGE DEVELOPMENT — GLOBAL LANGUAGE

Authors:	M.J. Mecham J.L. Jex J.D. Jones	Publisher:	Communication Research Associates, Inc. P.O. Box 11012 Salt Lake City, Utah 84111
Cost:	$20.00	Age Range:	1-15 years
Date:	1967	Administration Time:	30-45 minutes

Purpose: To provide clinicians with an objective instrument for measurement of expressive and receptive verbal language skills in both normal and handicapped children. It also utilizes the developmental approach for appraisal of language readiness.

Description

Begin testing items on approximately the C.A. level of the child. If the child fails to achieve 8 consecutive pluses above this level, then test downward until 8 consecutive pluses are achieved. The basal score is the highest consecutive plus. Items are then tested upward until at least 8 consecutive minuses are scored, at which time the test can be discontinued. There are 51 separate test items on the UTLD. Each one lists: a) the task, b) materials needed, c) procedure, and d) scoring directions (for giving the child either a plus or minus rating). Example: Can copy a square. Material: square drawn on score sheet.

Procedure. Give the child a pencil and say, "Make one just like this. Make it right here." Give three trials, repeating the directions for each trial. Do not allow child to use the side of one square as part of another or to trace the model. Score: If child copies one square acceptably out of three trials, score item plus. Square must have fairly straight lines and no round corners or ears.

Scoring. Total raw score is devised by counting the total pluses above the basal score. Language age is determined by looking up the total raw score on the manual's table and noting it's corresponding language age. Language quotient may be calculated by dividing the child's language age by his c.A.

Reliability. The scale is satisfactorily reliable as an objective testing instrument.

Validity. Unrestricted use of the test as a diagnostic instrument is not feasible until a larger collection of normative data is available. The validity of the test in relation to the Verbal Language Development Scale was 0.967.

Comments. The Utah test utilizes many aspects of psycholinguistic function in its appraisal and examiner can become quickly familiar with the rules and procedures of its administration. It can be administered in more than one sitting, thus it is a valuable instrument for use with aphasic or hyper-active brain injured persons. The scoring is convenient. It is, however, restricted, because use of this test as a diagnostic instrument must be limited until a larger collection of normative data is available. Most clinicians feel the Utah is a useful scale, especially if used as a language screening device. Many of the stimulus pictures and materials need to be revised and updated. Many of the pictures are very small and ambiguous.

HOUSTON TEST FOR LANGUAGE DEVELOPMENT GLOBAL LANGUAGE

Author: Margaret Crabtree

Publisher: The Houston Test Company
P.O. Box 35152
Houston, Texas 77035

Cost: Manual of directions, score sheets, vocabulary cards, miniature objects $35.00

Age Range: Part I; 6 mo. to 3 years
Part II; 3-6 years

Date: 1963

Administration Time: 30 to 45 minutes

Purpose: To provide a language scale for preschool age levels derived from the assessment of receptive and expressive abilities of the child.

Description

The test consists of 18 items that can be scored to indicate age equivalent. These 18 items are: self identity, vocabulary, body parts, gesture, auditory judgments, communicative behavior, temporal content, syntactical complexity, sentence length, prepositions, serial counting, object counting, repetition of speech patterns, repetition of melody patterns, geometric designs, drawing, verbalization while drawing, tells about drawing. Each test item lists the task, procedure and directions for scoring. Ex: Counting Objects: Have the child close his eyes while five cards are spread out face down on the table. Have the child count them. Repeat for 10 and 13 cards.

3 years: counts 2 cards
4 years: counts 3 cards
5 years: counts 10 cards
6 years: counts 13 cards

Scoring. Use the score sheet to determine the number of points the child would attain for items at each age level, 3 to 6 years. The appropriate symbols should be circled showing the highest level of success on each item. For instance, if the child scored at the 5 year level on communicative behavior, he should receive credit for the 3 and 4 year levels. The score for each age is obtained by counting the failures in each column and subtracting from the possible score for that age. The upper age is the highest age at which any item was passed. The language age is obtained by the sum of the scores. If a child scores within one year of age, performance should be considered adequate.

Norms. The normative scores of language age are based on data collected from the administration of the tests, part I and part II, to 215 children from the age of 6 mo. to 6 years.

Validity. Based on a reliable difference of the percents passing from one age to the next.

Comments. This is a good GLOBAL test. Kids like the tasks. The Houston has diagnostic value. The items chosen for diagnostic purposes included: a) communication tasks with which children who have language disorders experience difficulty and b) communication tasks are characteristic of normal children in this age range.

On the communication behavior task, you may want to cut down (5 to 10 minutes) on the time you give the child to relate to the toys.

RECEPTIVE-EXPRESSIVE EMERGENT LANGUAGE SCALE(REEL) GLOBAL LANGUAGE

Authors: Kenneth R. Bzoch
Richard League

Publisher: The Tree of Life Press, Inc.
1309 North East 2nd Street
Post Office Box 447
Gainesville, Florida 32601

Cost: $14.50

Age Range: Birth to 3 years

Date: 1971

Administration time: 5-10 minutes

Procedure. The Scale is primarily administered through the interview method. Contact the most knowledgeable informant and first record the information on the front of the Scale. While doing this one should strive to gain a rapport with the informant so as to be more confident in obtaining fuller, more accurate information about the child being discussed. Also, stress the importance of the evaluation to increase the informant's desire to be open and truthful in stating the information during the interview. If desired, the infant may be observed throughout the remainder of the interview. It is important to form a general impression of linguistic performance before suggesting specific details to the informant for elaboration. In other words, ask general questions before quoting the specific Scale items. One might say the following when discussing a three-month-old infant: "'Tell me how he responds to speech or how he demonstrates that he understands you' or 'Tell me when you have noticed him making sounds and what kind of sounds you have heard'". If the information desired is not noted, the examiner should then ask the specific item from the Scale. One may say, "'Does he turn his head toward the source of your voice when you talk to him?'"

When the informant is not positive of his/her response to the question, it may be necessary to observe the infant or have a supplemental interview. It is better to have just one short interview if at all possible.

Scoring. Start the scoring with the items in the left-hand column which are the RECEPTIVE items. The age interval that corresponds with the chronological age of the child is where one should begin. There are three items in each age interval. Each item will be scored either with a "+" (plus), a "-" (minus), or a ± (plus-minus). Score a plus(+) if the informant indicates that this behavior is typical. Score a minus(-) if the informant states that this behavior is not observed. Score a plus-minus(±) if the behavior is emergent or only partially exhibited.

When any two of the three items are scored with a plus(+) the child is given credit for that entire age-range. If and when the examiner has scored two pluses(+) at the infant's own age level, he should proceed to the next higher age level. Repeat this process until two minuses(-) are recorded within a given age range. It may be that the infant will not score two out of three pluses(+) at his own chronological age level. Should this happen score the next lower age interval. Repeat this process until at least two pluses(+) are scored within a given age range.

The highest tested age for the highest age interval scored as passed should be recorded on the front sheet in the box labled Receptive Language Age(RLA).

Next, the examiner will begin scoring the items in the right-hand columns. These are to assess the EXPRESSIVE language development. Scoring of expressive language should begin at the child's receptive language age (RLA), regardless of the infant's chronological age. For example, if an infant is found to have an RLA of twenty-four months, even though he is eighteen months old, scoring for expressive language should begin in the age interval 'twenty-two to twenty-four months'. The examiner then proceeds to score the expressive language items the same way the receptive items were scored. Record the highest age for the highest age interval passed on the front of the Scale in the box labled Expressive Language Age (ELA).

Only after the RLA and the ELA have been recorded can the Combined Language Age (CLA) be found. The CLA is defined as the arithmetic mean of the RLA and the ELA. The examiner obtains this figure by referring to Table 1 in the Appendix of the REEL manual. Table 2 in the Appendix of the manual is used to determine the Receptive Quotient (RQ), Expressive Quotient (EQ), and Language (Combined) Quotient (LQ). These should be recorded in the appropriate boxes on the front sheet of the Scale.

Validity. The Scale is assumed to have inherent validity since it is based, in part on the human infant language development described in the literature. This is substantiated by the findings obtained in the normal infants used in baseline study. REEL Scale scores have been found to correlate positively with intelligence and social maturity scores. Studies are being conducted to determine the degree of such correlations.

Reliability. Twenty-eight infants from linguistically stimulating environments were tested repeatedly. Using the criteria of test-retest agreement within plus or minus one age interval on the REEL Scale, agreement between different administrators for the infant population studied ranged from 90% to 100%. Administration of the Scale in this manner, followed by re-examination after a three-week interval, yielded an overall Language Quotient (LQ) correlation value of $r_s = .71$.

Comments. The REEL is one of the few procedures available to test the young infant's language. It provides an observation of both expressive and receptive language. Information is provided by an informant that sees the infant considerably more than the examiner but care should be exercised with these informally collected data. It is difficult to administer the REEL without some practice in phrasing the question so they don't sound formal and inflexible. The REEL is especially helpful in obtaining a specific language case history that can be used in conjunction with more formal tests.

COMMUNICATIVE EVALUATION CHART FROM INFANCY TO FIVE YEARS

GLOBAL LANGUAGE

Authors: R.M. Anderson
M. Miles
P.A. Matheny

Publisher: Educators Publishing Service, Inc.
75 Moulton St.
Cambridge, Mass. 02138

Cost: $0.25/chart - 4 page chart booklet

Age Range: 3 months to 5 years

Date: 1963

Administration Time: unspecified

Description

The Communicative Evaluation Chart was developed to facilitate early detection of childhood communicative disabilities. The chart provides a general impression of the child's abilities and disabilities in language and performances. Administration consists of informant interview and observation of the child. It can be administered by many specialists in fields related to child care and development.

The test items are divided into two categories: 1) those concerned with the child's capacity to acquire and use language as a communicative tool. This includes hearing acuity and auditory perception, acquisition of speech sounds, coordination of speech musculature, and growth of receptive and expressive language. 2) those concerned with physical growth and normal development, motor coordination, and visual-motor responses. The items are arranged sequentially and represent normal abilities at the following age levels: 3 months, 6 months, 9 months, 1 year, 1½ years, 2 years, 3 years, 4 years and 5 years. Scoring consists of (+) if the behavior is present (-) if it is not present, and (±) if it fluctuating. Numerous fluctuation or minus markings indicate the need for referral to clinically certified services for a more extensive diagnostic examination.

Comments. If used appropriately this chart may be very useful for aiding early identification and intervention of speech and language disorders. Most of the items were borrowed from other developmental scales such as those by Cattell and Gesell. The chart may guide the clinician in case history interviews. It could also be used as a quick screening device.

FAIRVIEW LANGUAGE EVALUATION SCALE (FLE) GLOBAL LANGUAGE

Author:	A. Boroskin	Publisher:	Research Dept. Fairview State Hospital 2501 Harbor Boulevard Costa Mesa, Calif. 92626
Cost:	Scale - $10.00/pkg. of 100 Manual - $.50 each Sample - $1.00 for manual & 1 copy of scale	Age Range:	3 months to 5 years (language age, not chronological age)
Date:	1972	Administration time:	not specified

Purpose: To assess levels of verbal and non-verbal language of the institutionalized severly and profoundly retarded.

Description

It is short and can be easily administered by parent or caretaker and it is easy to score. The author states that it is necessary for the rater to be familiar with the patient.

The test consists of 1) a face-sheet for identifying information and a checklist of speech-related handicaps; 2) detailed instructions for administering; and 3) the scale itself. The scale is composed of 10 levels arranged in descending order.

Procedure. The rater begins at level I (the highest level) and continues until all items at some level are checked or level X is reached. The language ability should be rated in terms of present status rather than past performance. The total score is computed to determine Language Age, Language Quotient, and Language Level.

Reliability and Validity. The manual provides data concerning reliability and validity. Future validation studies of the FLE and ITPA with both normal and retarded subjects are planned.

Comments. This test provides information on the subject's functioning in his environment rather than in just one specific situation. There is a need to be sure the rater understands how to administer the scale properly.

VERBAL LANGUAGE DEVELOPMENT SCALE (VLDS)

GLOBAL LANGUAGE

Author: Merlin Mecham

Publisher: American Guidance Service
Publisher's Building
Circle Pines, Minn. 55014

Cost: $3.25 Due handbook and several score forms.

Age Range: 0-14 years

Date: 1958

Administration Time: 15-30 minutes

Purpose: It is an informant-interview to assess the child's verbal language development in his daily life communicative activities.

Description

Administration. The method for administering this scale is the informant-interview. The usual procedure for testing is to begin at approximately one year below the C.A. of the child. If eight consecutive pluses are scored, the examiner can continue up the scale. If eight consecutive pluses are not achieved, the examiner proceeds downward from where he began until he is able to score eight consecutives pluses; all items below that level are considered plus in the final scoring. The examiner then continues testing up the scale until eight consecutive minuses are scored or until he reaches the end of the test, at which time he stops testing.

Scoring. In scoring each item on the score sheet, the examiner elicits a description of the behavior in question in such a way that the informant's responses are not 'cued off.' If the informant indicates that the essentials of the item in question are, or have been at an earlier time, routinely performed by the child whenever the occasion arises, a plus (+) score is given. All plus scores are given one full point of credit. For those items which the examiner is satisfied are in an emergent state only, a plus-minus (±) score is given. Plus-minus scores are given one-half point credit. When the examiner is satisfied that performance on an item is merely cursory or absent, a minus (-) score is given. No-credit is given for a minus in the final tally.

Reliability. Correlation coefficients of the 'alternative forms' of the scale on three different groups were .97, .72, and .81 respectively. A test-retest estimate of reliability on 15 of the children in the original norm sample indicated a correlation of .96 calculated by a rank-difference procedure.

Validity. The standard deviations for the items on the scale with a group of retarded group ranged from .37 to 1.69. Coefficients of variation were all less than .50, thus the items may all be considered as accepted valid.

Comments. The scale is easy to administer. It is good for children who cannot or will not respond to direct testing procedures because of severe physical or emotional problems, or young preschool children.

HANNAH-GARDNER PRESCHOOL LANGUAGE SCREENING GLOBAL LANGUAGE

Authors: E.P. Hannah
J.O. Gardner

Publisher: Joyce Publications, Inc.
18702 Bryant St.
P.O. Box 458
Northridge, California 91324

Cost: \$43.50 manual, forms, stimulus materials

Age Range: Toddler Screening 2½-3 yrs.
Full Test 3-6 yrs.

Date: 1974

Administration Time: 30 min.

Purpose: To screen psycholinguistic development in preschool children.

Description

The Hannah-Gardner was designed as a screening test for basic psycholinguistic development to be administered when more extensive and formal procedures cannot be validly administered. The Hannah-Gardner can be administered by professionals in any field associated with preschool children with referrals made to qualified persons in the field of language on the basis of the percentile scores. The test is composed of four sections: 1) visual perception, 2) motor development, 3) auditory perception, and 4) conceptual development. The auditory and visual sections are grouped into test items assessing memory span, figure ground, closure, and sequencing. The conceptual development section assesses numbers, prepositions, colors, and judgment. The materials required for test administration include: test instruction manual, picture file, and Copy Me file; a booklet of test questions and 10 record sheets; 12 sets of picture cards in a plastic spiral booklet, and 22 objects for manipulation.

Procedure. Each test question contains specific instructions to the examiner and the stimulus to be presented to the child. However, this test does not provide specific guidelines for judging appropriate responses on many of the items. The record form that accompanies the test is designed to remain in the test questions booklet during administration. All responses are recorded during the test. Test questions are scored as 1 or 0 on the record form. Raw scores and percentile scores are computed at the end of each of the four sections in addition to a total raw score and percentile based on the results of the four sections.

Norms. Normative data are provided for middle and lower socioeconomic levels separately. The data were collected from a total group of 180 children. However, since the middle and lower socioeconomic levels were provided separately, 15 children were included in each of the age levels. Test-retest reliability was established for the H-G. Validity for the test was obtained by establishing the correlation between the H-G and the ITPA.

Comments. The Hannah-Gardner is very effective in maintaining the children's attention. The test is well organized. The test questions are well presented but response guidelines are needed in greater detail for objective, consistent scoring. The stimulus materials require a lot of manipulation by the examiner and the children are distracted by some of the materials. The responses are easily scored during the test. The sectional arrangement of the Hannah-Gardner provides the examiner with an organized review of the child's responses. However, the sectional review and the percentile scores are the only information provided about the child's performance. Due to the time required for administration, the Hannah-Gardner would not be suitable for the typical screening situation.

PARSONS LANGUAGE SAMPLE(PLS) GLOBAL LANGUAGE

Author: Joseph Spradlin

Publisher: Spradlin, J.E. Assessment of speech and language of retarded children: The Parsons Language Scales. JSHD. Monograph Supplement 10, 1963.

Date: 1963

Age Range: variable

Administration time: variable

Purpose: To sample language according to the Skinnerian model of learning.

Description

The PLS samples observable language (both vocal and non-vocal) in various controlling situations. This system of grouping language according to the situations in which it occurs is taken from Skinner.

The test has two sections, vocal and non-vocal. There are seven subtests and 123 test items. The vocal section consists of 1) the tact subtest, which samples picture and object naming; 2) the echoic subtest, which is a series of items requesting the subject to repeat words, sentences and numbers of varying degrees of complexity; and 3) the intraverbal subtest, which consists of items ranging from simple questions, such as, "What do we do when we are hungry?" to "In what way are an egg and a seed alike?" The non-vocal section consists of 1) the echoic gesture subtest, which is composed of items which evaluate the child's ability to imitate a motor act; 2) the comprehension subtest which consists of questions which can be answered by either a vocal or gestural response. Some of the questions of the intraverbal gesture subtest, such as "Where is your ear?" have a high probability of eliciting gestures. Others, such as "What do you do with a handkerchief?" are much less apt to elicit a gestural response. Only gestures are scored. A final subtest, the mand, measures both vocal and non-vocal responses, and is composed of situations in which the appropriate response would be to ask a question or make a request. For example, the examiner might ask the child to draw a picture but fail to make paper and pencil available.

All test items are included in a test booklet which contains specific instructions to the examiner about the stimulus to be presented, and specific guidelines for judging appropriate responses. Test questions are scored as (✓) appropriate, (X) inappropriate, (✓̸) unintelligible, or (-) no response. All responses are recorded in the booklet during the test, and vocal responses to vocal subtest items are recorded verbatim. A raw score for each of the subtests may be computed, in addition to a vocal composite subtest score, and non-vocal composite subtest score.

Reliability and Validity. Test-retest reliability on 30 subjects tested by the same and different examiners ranged from .64 to .99. Several types of validity have been obtained on the PLS, including the correlation (.75) between the PLS vocal subtest scores and Wechsler Scale Verbal IQ scores.

Comments. The PLS samples language in a well organized fashion. The PLS can be replicated exactly, thus providing a standard method of presenting materials and test items. Language is measured in a formal situation with an adult present, and may or may not be representative of behavior in other situations. The use of the PLS has been limited mainly to mentally retarded children. The scores are not too meaningful outside of this context. It could be better used if norms based on groups of normal children were provided.

REYNELL DEVELOPMENTAL LANGUAGE SCALE (EXPERIMENTAL EDITION) GLOBAL LANGUAGE

Author: Joan Reynell

Publisher: NFER Publishing Co., Ltd.
2 Jennings Bldg. Thames Ave.
Windsor, Berks, England

Cost:

Age Range: 6 months-6 years

Date: 1969

Administration time: 20-30 minutes

Purpose: To provide clinician with a tool to aid language assessment of very young children.

Description

This test consists of three scales:

1. Verbal Comprehensive Scale A: Requires some hand function but no speech.
2. Verbal Comprehensive Scale B: An adaption of Scale A for use with severely handicapped children who have neither speech nor hand function.
3. Expressive Language Scale: Three sections which can be scored separately or as a whole.
    a. language structure
    b. vocabulary
    c. content

Procedure. The stimuli are presented in a play situation which is structured but not rigid. The toys are placed in front of the child and a request made by the clinician such as "Stand the girl doll up". The instructions must be carried out exactly by the child for a success to be scored. The scoring is in terms of an equivalent age level and a standard score for each raw score obtained.

Norms. Score for 25 British boys and 25 British girls at each half year from 6 months to 6 years are reported.

Comments. An advantage of the test is that it tests very young children and follows the normal developmental pattern over the age range 1 to 5 years. It is easy to score and the instructions are explicit. A disadvantage is that there are too many different stimulus items which require a lot of manipulation on the part of the examiner.

PRESCHOOL LANGUAGE SCALE(PLS) GLOBAL LANGUAGE

Authors: Irla L. Zimmerman
Violette G. Steiner
Roberta L. Evatt

Publisher: Charles E. Merrill Publishing Co.
Columbus, Ohio

Cost: $4.95 manual, picture book, record booklet

Age Range: 1.6 to 7 years

Date: 1969

Administration time: approximately 30 minutes

Purpose: To be used to detect language strengths and weaknesses in young children.

Description

A language evaluation instrument consisting of two sections: Auditory comprehension and Verbal Ability. The Auditory Comprehension portion is designed to determine whether the child can receive and understand auditory information and to provide a measuring instrument for recognition and comprehension of noun and non-noun words, the stages of concrete and abstract thought, concept acquisition and the ability to understand grammatical features of the language. The Verbal Ability portion is designed to help determine whether a child can verbalize adequately as measured by his responses on a series of graded tasks and to provide an instrument for measuring such aspects as vocabulary (word availability), verbalized memory span, stages of concrete and abstract thought, concept acquisition, articulation and ability to use grammatical features of the language.

Procedure. The child is asked to respond to four items at each age level until all four items at one level are missed.

Scoring. Criteria for acceptable responses is given for each individual item. From the results a language age and language quotient can be calculated.

Norms. There is no standardization population. Each item is referenced to indicate literature in which data supporting the inclusion of that item can be found. Each item is derived from research which places it in the developmental sequences used.

Reliability and Validity. None reported.

Comments. This test is easy to administer and requires no special preparation from the examiner. The test gives a broad overview of the preschool child's language development in a relatively short time.

PORCH INDEX OF COMMUNICATIVE ABILITY IN CHILDREN (PICAC) GLOBAL LANGUAGE

Author: Bruce E. Porch

Publisher: Consulting Psychologist Press, Inc.
577 College Avenue
Palo Alto, California 94306

Cost: not available

Age Range: Preschool to 5 years (Basic Battery); first grade level to 12 years (Advanced Battery).

Date: 1974

Administration time: 60 minutes

Purpose: To assess general communication ability in terms of certain verbal, gestural, and graphic skills.

Description

The PICAC is divided into two batteries: The Basic and Advanced. There are 15 subtests in the Basic and 20 in the Advanced. All subtests (except the geometric form tests) use 10 common objects as stimuli (toothbrush, key, comb, brush, fork, spoon, crayon, pencil, ring, and scissors) and require the child to respond verbally, graphically, and by gesture.

The Basic Battery Subtests: Verbal Function. The child is required to describe with a complete sentence the function of the objects. Gestural Function. The child is asked to demonstrate gesturally the function of the objects. Verbal Naming. Requires the child to name the objects. Verbal Completion. The child supplies the name of the object to an incomplete sentence frame that describes the function of the object (e.g., "You lock a door with a _____.") Reading Names. This requires the child to match the written name of the object with the object. Auditory Commands. The child is directed to perform certain gestural responses to verbal commands (e.g., "Point to the key," "Touch the toothbrush.") Visual Pictures. The child is directed to match a picture of the object with the object. Auditory Naming. The child points to the object named by the examiner. Verbal Imitation. The child repeats the name of the object as modeled by the examiner. Visual Matching. The child is directed to match identical objects. Graphic Tests. These include four subtests: (1) writing the name of the object after spoken by the examiner, (2) writing the name after it is spelled, (3) copying the name, and (4) copying geometric forms.

Advanced Battery: The majority of the subtests for the Advanced Battery are similar to those presented in the Basic Battery; however, additional tests are included which assess more complex skills. For example: Verbal Description. This requires the child to describe the object in terms of three categories--color, shape, and composition. Reading (Function). The child is required to read a card that describes the function of an object and then match the card to the appropriate object. Reading Backwards. This requires the child to read words printed in reverse letter order. Verbal Imitation. This requires the child to repeat short sentences (4-5 words in length) spoken by the examiner. The sentence modalities include interrogatives, imperatives, negatives, and declaratives. Graphic Function. This child is directed to write a sentence describing the function of the objects.

Scoring. The responses are described using a multidimensional scoring system rather than the plus-minus dichotomy which is generally employed by other tests. The child's response to a given item is recorded in terms of a 16 category rating scale. Mean scores for each subtest, each modality (gestural, verbal, and graphic) and the entire test (Overall Score) are converted into percentiles.

Reliability and Validity. This information is unavailable at present.

Norms. There are no norms available at the present time.

Comments. This test cannot be administered by an untrained examiner. Forty hours of study and supervised practice in administration and scoring are required. The test is comprehensive and with further standardization and development offers great promise.

THE MICHIGAN PICTURE LANGUAGE INVENTORY GLOBAL LANGUAGE

Authors:	L. Lerea W. Wolski	Publisher:	University of Michigan Speech Clinic Ann Arbor, Michigan
Cost:	$15.00	Age Range:	4-6 years
Date:	1962	Administration time:	(Vocabulary Test) 10-15 min. (Language Structure Test) 30-40 minutes

Purpose: To measure the normal and language-retarded child's ability to express and comprehend vocabulary and language functioning.

Description

The Vocabulary Test consists of thirty-five key items pictured with two foil items selected on the basis of some functional relationship with the key items. Expression is tested first by asking the child to name only the key items on each card. The examiner says, "What is this a picture of?" After testing forexpression the examiner retests for comprehension using only the items which he fails to name or names incorrectly.

The Language Structure Test consists of 50 cards which test sixty-nine comprehension and expression responses. The test is divided into nine sections, each testing a particular class of words: 1) singular & plural nouns, 2) personal pronouns, 3) possessives, 4) adjectives, 5) demonstratives, 6) articles, 7) adverbs, 8) prepositions, 9) verbs & auxiliaries.

Procedure. Each section is tested separately, following a specific three-step procedure: 1) the cards are described, 2) returning to the first card the examiner tests the key items for expression, and 3) again returning to the first card the examiner presents the set of cards a third time to test for comprehension of the item. (There are detailed instructions in the booklet for each section.)

Scoring. Each correct expression and comprehension response (both the Vocabulary and Language Structure Tests) receive a point value of one.

Norms. Mean scores and standard deviations are given for 4, 5 and 6 year old boys and girls for both vocabulary expression and comprehension and language structure expression and comprehension (180 children).

Reliability. Reliability coefficients for the Vocabulary Test are somewhat low but the authors feel that gross mis-classifications won't occur among children.

The generally small size of the standard errors of measurement suggests gross mis-classifications will not occur for 4, 5 and 6 year olds on the Language Structure Test.

Validity. The test of validity for the Vocabulary Test is based on selection of test items for the Buckingham and Dolch word count. There were significantly higher mean scores at successive age levels.

Estimates of test validity for the Language Structure Test, based on content validity and the finding of significantly higher mean scores for boys and girls at successive age levels, suggest that it possesses sufficient validity.

Comments. This is not a commonly used test. A decided advantage is that it measures both comprehension and expression and provides a language description as well as a score. It contains the only standardized test of expressive vocabulary. However, the stimulus pictures are small and not very clear. Administration of both the Vocabulary and Language Structure Tests is time consuming. Also, the number of pictures per page may be distracting.

Appendix B. PHONOLOGICAL TESTS

DEVELOPMENTAL ARTICULATION TEST

PHONOLOGY-PRODUCTION

Author: Robert F. Hejna

Publisher: Speech Materials
Box 1713
Ann Arbor, Michigan 48106

Cost: $2.00, 25 scoring sheets and instructions

Age Range: unspecified

Date: 1959

Administration time: 7-15 minutes

Purpose: To assess consonant sounds on a developmental scale, testing sounds according to the various chronological age levels by which 90% or more of children use the sounds correctly.

Description

The Developmental Age Level, as used in this test, refers to the age by which 90% or more of children have acquired that sound. It should be kept in mind that the developmental age scales are approximate, and are based on normative data bearing on this subject. Exceptions to the 90% rule are found for the final /b/, /g/, and /z/ sounds. Approximately 75% of all children should be able to produce these sounds correctly by the age specified. The /zh/ and /hw/ sounds have been omitted from the test, because the /zh/ sound is so infrequently used and is not used correctly by 90% of the children, even by eight years of age, and the /hw/ sound is used correctly by a small percentage of children even by age eight.

Procedure. Present the cards individually to the child being tested with a beginning statement, such as, "Would you like to look at some pictures? Here they are. Tell me what these are. What's this?" Point at each picture with a pencil as you go through the test. As with any picture test, some children may be unable to identify all the pictures. If this occurs, name the picture for the child and ask the child to repeat the name. On card 1, the usual response to the picture "puppy" is "dog" so then ask the child, "What is a small dog called?". On card 10, if the child cannot identify "onion," as an alternative, ask the stimulous question, "What should you say if someone gives you something nice?", and also on card 10 ask the child to name the color. For card 25, after the child identifies the feathers, ask, "Which is bigger, this one or that one?" Point to each feather as you ask the question.

Scoring. On score sheet, mark the defective sounds according to position, in columns 1, 2, and 3. Score results as in the following examples: Substitution, t/s; omission, -/s; and distortion, /s. Then ask the child to produce sounds he missed, in isolation and mark the result in the column "Iso.".

Comments. This is a quick, easy test to administer. It is quite inexpensive. It is an easy test to carry with you because of the small size of the cards and simple scoring sheet. The pictures are not very clear and some of the concepts, such as the alternative for the picture "onion" may be hard for a very young child to understand.

PHONETIC ANALYSIS OF SPEECH SAMPLE PHONOLOGY-PRODUCTION

Author: A.J. Compton

Publisher: Generative studies of children's phonological disorders. Journal of Speech and Hearing Disorders, 1970, 35, 316-339.

Cost:

Age Range: variable

Date:

Administration time: variable

Purpose: To illustrate that 1) the defective sounds of speech characterizing an articulatory disorder are part of a coherent and productive system organized by means of phonological principles and 2) failure to take account of these organizing principles leads to hit and miss therapy which may not only be ineffectual but sometimes may even create new misarticulations.

Description

According to Compton, the errors characterizing articulatory disorders are generally not specific to single sounds, but rather, are a reflection of systematic patterns of errors encompassing entire classes of sounds possessing one or more features in common.

The author presents examples of two children with "normal" abnormal articulation to demonstrate the kinds of phonological principles which must be taken into account routinely in order to accurately diagnose and plan an effective program of therapy for a child with an articulation disorder. The analyses are based upon close phonetic transcriptions of the children's naming responses to a series of approximately 100 pictures.

Procedure. Compton's procedure consists of first obtaining a sample of the child's speech, then making a detailed listing of misarticulations. The errors are then summarized. The child's phonological rules are then determined. The rules are then examined in terms of distinctive features.

Comments. Compton feels that once we shift our focus from the individual errors the child produces, to the patterns these errors follow, the unifying principles that underlie the patterns begin to emerge. Over and above the gains in descriptive adequacy resulting from the analyses, are the clinical implications which follow from the generalizations that have been made. Once the pattern is determined, the elimination of any specific articulatory error will be effected when the principle underlying the error is revised, eliminated or replaced. Therefore, any other errors arising from the same principle also will cease to be. This procedure offers excellent possibilities for future diagnostic development. It is not an easy procedure to apply and probably takes more training than most clinicians typically possess.

THE FISHER-LOGEMANN TEST OF ARTICULATION COMPETENCE PHONOLOGY-PRODUCTION

Authors: Hilda B. Fisher
Jerilyn A. Logemann

Publisher: Houghton Mifflin Company
Boston, New York, Atlanta,
Geneva, Ill., Dallas, and
Palo Alto

Cost:

Age Range: Children and adults

Date: 1971

Administration Time: Picture Screening Test - approximately 2 minutes, Complete Picture Test 5-10 minutes, Sentence Test 5 minutes

Purpose: To identify and characterize the phonemes the individual cannot produce adequately and/or distinguish from other phonemes adequately.

Description

Two test forms are provided: I.) The picture form elicits spontaneous responses to 109 picture stimuli presented on 35 cards. Included in the Picture form is a screening test comprised of the eleven consonant phonemes which are most frequently misarticulated. II.) The sentence form is read by the subject and consists of 15 sentences presented on one card.

Both test forms test all English phonemes in occurrence according to their syllabic function (initial, medial, or final position). A record sheet is provided with each form of the test so that articulation errors may be analyzed according to distinctive features which are violated.

Norms. This test was designed as a clinical assessment tool, therefore normative data has not been established. However, the developmental age at which 90% of children would be expected to achieve mastery of the consonant phonemes in all positions (Henjna, 1959) is provided.

Reliability. No mention of reliability was made.

Validity. 30 speech therapists administered the test to 500 children. All the therapists expressed favorable views on the general linguistic basis of the test, the test organization, and the instructions.

Comments. The Fisher-Logemann Test of Articulation Competence requires practice to administer and can be time-consuming if one is not skilled in recording with phonetic symbols and modifiers. Many articulation tests have been designed to identify which phonemes are inadequate. This particular articulation test goes beyond this as it also helps to determine the nature of the phoneme inadequacy and to determine if there is a commonality between error phonemes in production violation. This test allows the clinician to note dialectal characteristics and these are not included in the list of error phonemes.

ARIZONA ARTICULATION PROFICIENCY SCALE (AAPS) PHONOLOGY-PRODUCTION

Author: J.B. Fudala

Publisher: Western Psychological Services
12031 Wilshire Boulevard
Los Angeles, Calif. 90025

Cost: $18.50 manual, 48 picture test cards, sentence test, protocol booklet and survey forms

Age Range: 3 to 11 years

Administration Time: approximately 10-15 minutes

Purpose: To assess acticulation skills in children.

Description

This articulation test is based on the idea that the more frequently a misarticulated sound is heard in speech, the greater the articulation problem. Therefore actual errors are not only recorded, but each consonant and vowel are assigned numeric values based on the number of times it probably would occur in 100 consecutive speech sounds. (These values were taken from a study done by Bell Laboratories on relative frequency of occurrence of speech sounds.)

Procedure. Administration time of the test ideally is 15 minutes. The examiner simply shows the pictures to the client while saying "I am going to show you some pictures and I would like you to tell me what they are." On the sentence form, the instructions are simply "Read these sentences aloud." (The picture booklet contains 2 cards in which the client is asked to tell a story.)

Scoring. Errors for consonants and vowels are recorded on the Protocol Booklet as: X distortion, - omission, / substitution. Then when an error occurs the numeric value for that sound is circled. To obtain a score, total circled numeric values and this provides the Total Consonant and/or Total Vowel Score. By adding these two scores you obtain a Total Sound Score. The Total Sound Score is subtracted from 100 to obtain the percentage of correct articulation.

Norms. AAPS provides normative data on children from 3 to 11 years. These norms are based not on average ages but rather on ages where 90% of the children tested had mastered each sound.

Reliability and Validity. Reliability was recorded at .96 (test-retest interval within one week) and was obtained by 19 public school speech clinicians testing 105 children. Studies for validity revealed a correlation coefficient of .92 between AAPS scores and defectiveness rating of spontaneous speech.

Comments. This test allows a precise determination of misarticulation and measures the precise degree of severity. The stimuli used are quite good but the scoring procedures are somewhat confusing. The standardization data are somewhat questionable and need further study. This seems to be a good measure to assess improvement in articulation performance over time.

PREDICTIVE SCREENING TEST OF ARTICULATION PHONOLOGY-PRODUCTION

Authors: C. Van Riper
R.L. Erickson

Publisher: Continuing Education Office
Western Michigan University
Kalamazoo, Michigan 49001

Cost: $.50

Age Range: Most appropriate for 1st grade

Date: 1970

Administration time: 7-8 minutes

Purpose: To differentiate between children who will master their misarticulations without speech therapy from those who, without therapy, may continue with their errors.

Description

The PSTA is used to identify among elementary school age children who have functional misarticulation at the first grade level, those children who will, and those who will not, have acquired normal articulation by the time they reach the third grade. The materials required for administration are the test manual and a score sheet which accompanies the manual.

The PSTA consists of 47 items. The test evaluates articulation of single consonants in the initial, medial, and final positions and blends in the initial position; articulation of a single sentence and ability to imitate the sentence accurately; the child's ability to imitate the /s/ and / / in isolation; articulation of five consonants in specified syllable; the child's ability to move the tongue independently of the jaw and lips in producing the syllable /la/; discrimination of correct and incorrect production of words; and the child's ability to replicate a hand-clapping rhythm.

Scoring. Responses are recorded on a separate sheet by circling 1 for a correct response and 0 for an incorrect response. Total points are tallied and recorded on the record sheet. Final selection of a cut-off score for selections of a caseload is left to the clinician. The authors recommend a tentative cut-off score of 34.

Validity. Six studies by researchers independent of the authors have explored the predictive validity of the PSTA. The studies suggest that relatively accurate predictions may be expected although additional data needs to be collected beyond this test for determining case selection.

Comments. This test is a helpful addition to the literature. It should not be used as sufficient basis for excluding children from therapy, however.

AUDITORY DISCRIMINATION TEST PHONOLOGY-COMPREHENSION

Author: Joseph M. Wepman

Publisher: Western Psychological Services
12031 Wilshire Boulevard
Los Angeles, California 90025

Cost: $8.50

Age Range: Norms for ages 5 - 8

Date: 1973

Administration Time: approximately 5 minutes

Purpose: To detect persons who have difficulty with auditory discrimination of English phonemes.

Description

The test consists of 30 pairs of words differing in a single phoneme in each pair and 10 word pairs which don't differ. The child should face the examiner while receiving the instructions and while practicing the 5 sample word-pairs. However, when testing begins he should then be seated so he can't see the examiner's mouth. There are two response columns headed - DIFFERENT and SAME. All unshaded boxes are to be marked with either a + or -.

Scoring. The scoring is obtained by counting the correct responses (i.e., the number of +'s in the DIFFERENT column only).

Validity. The test should not be considered valid if either or both of the following conditions exist; a score of LESS than 10 in the DIFFERENT column and/or a score of LESS than 7 in the SAME column.

Norms. Norms for 5, 6, 7 and 8 year-olds are available. Two methods are available for interpreting the scores; a comparison with his age group (cross-sectional approach) using a 5 point rating scale and a comparison between a child's individualized scores over a period of time (longitudinal approach).

Reliability. Test- retest administration showed reliability coefficients of .91 and .95.

Comments. Reliability between examiners would probably be low. Various parameters would vary: pronunciation, intensity level and degree of emphasis each word does or does not receive. An essential element in this test is the word-pairs selected. Wepman did an excellent job. Word-pairs were matched according to: phonetic placement, length, a single discriminating feature and familiarity/frequency index. This test is very popular among speed and language clinicians and special education specialists. One disadvantage that has often been cited is that the child must have understanding of the concept SAME and DIFFERENT.

GOLDMAN-FRISTOE-WOODCOCK TEST OF AUDITORY DISCRIMINATION (GFW)

PHONOLOGY-COMPREHENSION

Authors: Ronald Goldman
Macalyne Fristoe
Richard W. Woodcock

Publisher: American Guidance Service, Inc.
Publishers' Building,
Circle Pines, Minn. 55014

Cost: $27.00 for complete easel-kit with spiral band pictures, 50 forms, and pre-recorded tape

Age Range: 4 years to adult

Administration time: Training - 5 min.
2 subtests - 7.5 min.

Description

The test has three parts:

1) Training Procedure - is employed as the first step to familiarize the subject with each of the word-picture associations to be used during the two subtests. It consists of 16 plates with 4 pictures on each plate. The 4 pictures represent 4 words which have little phonetic similarity, e.g., "lake," "nail," "pear," and "tea." The examiner requests the subject to point to the picture of the word presented to him as a stimulus.

2) Quiet Subtest - provides a measure of auditory discrimination in the absence of background noise. The subject is again asked to point to the picture of the word presented; however a tape player is used to present the instructions and stimulus statements. There are a total of 30 plates containing 4 pictures on each.

3) Noise Subtest - provides a measure of auditory discrimination in the presence of distracting background noise. There are 3 training plates having an increasing level of background noise to help the subject adapt to the new and more difficult listening task. The stimulus statements and instructions are again presented by a tape player. There are also 30 plates containing 4 pictures each.

On both subtests the 4 words represented on each test plate are similar in sound except for a single phoneme, e.g., "lake," "make," "wake," and "rake."

Scoring. There are two levels of scoring information on each subtest. The first level involves simply counting the errors made in each subtest, translating these error scores into percentile scores. The second level of scoring produces an error score for each of the five cells in the Error Analysis matrix for a subtest. This provides error scores on voiced sounds, unvoiced sounds, plosives, continuants, and nasals. This level should be used only for research or clinical exploration and must be used cautiously since the reliability of these scores is low.

Norms. Normative data is provided for subjects ranging in age from 3 years 8 months to above 70 years. The test was standardized on 745 subjects, 3-84 years of age.

Reliability. Internal consistency reliability coefficients (242 subjects) are low which they reported due in part to the shortness of the test and the narrow performance range of the normal segment of the population. A test-retest correlation of .87 was obtained on the Quiet subtest and a correlation of .81 was obtained on the Noise Subtest. This was administered to a sample of 17 children.

Comments. There are certainly a number of advantages of this auditory discrimination test over previous tests. These include: the wide range of norms, the subject's responses are not dependent on his knowledge of the SAME-DIFFERENT concept, has a testing-training procedure to assure the child knows the vocabulary, and prevents the stimuli in a standardized fashion. The low reliability needs to be further assessed. Many clinicians have noted that the noise subtest may be too difficult especially for younger subjects.

TEST OF LISTENING ACCURACY IN CHILDREN (TLAC) PHONOLOGY-COMPREHENSION

Authors:	M.J. Mecham, J.L. Jex, J.D. Jones	Publisher:	Communication Research Associates, Inc. PO Box 11012 Salt Lake City, Utah 04111
Cost:	$20.00	Age Range:	Kindergarten, 1st & 2nd grades
Date:	1973	Administration time:	approximately 22 minutes

Description

The TLAC was designed as a modification of tests used in constructing adult intelligibility tests for use with young children. Materials needed for test administration are the picture plates, cassette tape, cassette tape-recorder with a 10 unit intensity dial and an individual test score sheet. The picture plates are presented in a spiral bound book. The words represented in the book were selected from the 2000 most frequent words from the Thorndike list. The test items were selected from 132 words used as the auditory stimuli in a listening test that was given to 40 mentally defective children. Items that elicited over 85% correct responses and those which were less than 15% correct were discarded as not being discriminating. The remaining 86 items comprise the TLAC.

Procedure. The test stimuli are presented from a prepared tape-recording. The cassette recorder should be two feet from the child's right ear. Earphones are not to be used. The tape begins with the instructions that a man will say three words but only one of the words corresponds to one of the three pictures on a test plate. The other two pictures are named incorrectly. The child is to point to the one picture which is named correctly. Six practice items which are similar to the test items are presented before the test items. The practice items are also presented from the prepared tape. If the practice items are pointed to correctly the tape continues with the test items. If the child responds inappropriately the examiner should stop the tape and explain the instructions live voice before continuing. The acoustic stimuli were recorded in a background of white noise to increase the sensitivity of the test and insure a wider dispersion of scores. No provision for quiet testing is available. Following the practice items the entire tape is played.

Scoring. The examiner scores a plus (+) for a correct response and a minus (-) for an incorrect response. The total score is the total number of correct responses (excluding practice items) on the test.

Norms. A table for interpretation of scores is provided in the test manual. Normative data for Kindergarten, 1st and 2nd grades is included. The total score can be used to determine a percentile ranking according to these 3 age groups. The percentile can then be compared to a range: normal-25th to 75th percentile, excellent-80th to 95th percentile, superior-above the 95th percentile, inferior-between the 20th and 5th percentile, very poor-below the 5th percentile. Normative data were collected from test results of 300 normal elementary school children selected from 2 school systems in Utah which represented rural and urban classes.

Reliability. The internal consistency of the test was used to estimate its reliability by use of the Kudor-Richardson analysis of variance techniques to establish reliability estimates for each grade level. Reliability estimates were: kindergarten-.828, 1st grade-.792 and 2nd grade-.754.

Comments. The test items are not colored but clearly represent the vocabulary items they intended. The test is very long for a young child; 86 items with three words per item totals 258 words to which the child must carefully listen. The test requires good attention and auditory memory as the words are presented quickly. No provision was made for quiet testing so no comparisons between scores in noise background and quiet background can be made. No provisions for a second form for retesting are provided. The test is presented from a prepared tape assuring constant stimulus presentation. The child must discriminate among three words. Norms are quite general; only gross age divisions have been made (kindergarten, 1st grade and 2nd grade.) Some of the vocabulary items may not be known by the child so if he fails an item it is not possible to determine from this test if he failed due to poor discrimination or inadequate vocabulary. The practice items are not intended to insure the child knows all the vocabulary words as they are on the Goldman-Fristoe-Woodcock Test of Auditory Discrimination. The test sheet is easy to score and although the test instructions state to score an item as either (+) or (-), it is just as simple to write down the letter of the picture the child selected (either A, B or C) in the blank provided. Later this could be used to determine if the subject had specific error patterns.

TEMPLIN PICTURE SOUND DISCRIMINATION TEST — PHONOLOGY-COMPREHENSION

Author: Mildred C. Templin

Publisher: Templin, Mildred C., *Certain Language Skills in Children*, (Institute of Child Welfare Monograph No. 26) pp. 14-15, 61-67 The University of Minnesota Press, Minneapolis, Minn.

Cost: Book

Age Range: 3 to 5 years

Date: 1957

Administration time: variable

Purpose: To test young children's ability to discriminate among speech sounds.

Description

Procedure. Pairs of pictures of familiar objects whose names are words similar in pronunciation except for single sound elements presented. (92 words are used in 59 pairs). The child is seated facing the examiner. To familiarize the child with the procedure, the examiner should use a "trial card", not included in the test. If SCORE C is to be used, have the child name the pictures which represent each test word. According to the test for significance between age levels, Method C is the most discriminating. When the child understands the procedure, go through the cards naming the test words (capitalized). Give at least two presentations of all the cards giving the same word both times. If two identifications are correct, a third presentation isn't made for that pair. If the stimulus word was both correctly and incorrectly identified, a third presentation of the pair of pictures was made.

Scoring. There are 3 different methods of scoring; Score A - Number of items in which *two out of three* responses are correct. (No attention is given to whether the test words were identified correctly); Score B - Number of items in which *two out of two* responses are correct. (No attention is given to the test words); Score C - Number of items in which *two out of either* two or three responses are correct and in which *both* discrimination words have been correctly identified previously.

Validity and Reliability. Not available

Norms. Norms for 3, 4 and 5-year-olds employing mean, standard deviation, and range of scores are available. Also in table-form is a comparison of the mean sound discrimination scores for both sexes.

Comments. The stimulus pictures are poor. The "trial cards" used to familiarize the children with the procedure aren't available in the test booklet. Scores A and B assume that all test words are familiar to a child. The preferred method is C. There was no available space alloted for scoring on the test sheet. Using only pictures as testing items limits the number and kinds of words utilized. There is a danger that the child might be unfamiliar with both words and point to the word most familiar to him.

COMPOSITE AUDITORY PERCEPTUAL TEST(CAPT)   PHONOLOGY-COMPREHENSION

Authors: B.B. Witkin
K.G. Butler
D.L. Hedrick
C.C. Manning

Publisher: Alameda County School Dist.
224 West Winton Avenue
Hayward, California 94544

Cost: $5.00

Age Range: Grades 1-3

Date: 1973

Administration time: 45 minutes

Purpose: To assess major auditory perceptual processes in primary grade children.

Description

The test is given in three parts with short rest periods in between. The children make responses with a marking pencil in a response booklet, which has pictures in a multiple choice format.

Part 1 consists of 40 items that test figure-ground discrimination, part 2 consists of 40 items testing temporal sequencing and analysis and discrimination of selected vowels and consonants, and part 3 consists of 54 items testing phonemic closure, synthesis, memory for number of syllables in real and nonsense words, and discrimination of linguistic forms and verb tenses.

Comments. The CAPT was criterion-referenced to the Auditory Perceptual Training Program. Though it was constructed to be used along with the APT program, it can be used for diagnostic purposes and as a norm-referenced test.

LINDAMOOD AUDITORY CONCEPTUALIZATION TEST PHONOLOGY-COMPREHENSION

Authors:	Charles Lindamood, Patricia Lindamood	Publisher:	Teaching Resources Corp. 100 Boylston Street Boston, Massachusetts
Cost:	$15.00, Manual, colored score sheets A or B, blocks, record	Age Range:	K-12 (possibly younger)
Date:	1971	Administration time:	variable, approximately 10 minutes.

Purpose: To teach the subjects the ability to discriminate one speech sound from another and the ability to perceive the number and order of sounds.

DESCRIPTION

Though the authors work with people having reading, spelling, and speech disorders, they found that they could discriminate same and different; but could not judge precisely how and where two syllables or words were different. Thus the LAC Test and the Auditory Discrimination in Depth Program were developed. The LAC test is a diagnostic test that permits an early and specific identification of students with auditory perceptual deficiency or dysfunction. The students can be given a program to develop a perceptual base for success in reading, spelling, speech and language.

Procedure. The test is divided into two categories with a gradual increase in the complexity of the patterns to be judged with each category. The subject is required to manipulate colored wooden blocks to indicate his conceptualization of speech patterns given by the examiner. The examiner records the client's responses by noting block manipulation and compares responses with color code on the score sheet which indicates what patterns were incorrectly perceived, how subject erred, and what sounds were confused.

Scoring. Recommended minimum scores are listed for grades K-12 and separated into first and second half of the year.

Reliability and Validity. Reliability was determined by test-retest with alternate forms on a sample of 52 students (4 from each grade K-12). The test-retest reliability between forms A and B was +.96 indicating high reliability. The Wide Range Achievement Test (WRAT) was used to compare scores with a correlation average of +.73 (average of +.66 and +.81).

Comments. A complete appendices includes test construction, recommended minimum scores, interpretation and educational follow-up. The test is well organized, easy to administer and requires very little equipment. It produces some interesting information about childrens' auditory abilities. Our experience suggests that the test should not be used with younger children unless the examiner is sure they understand the concepts same and different, numbers to four, left-right, and first-last.

AUDITORY MEMORY SPAN TEST PHONOLOGY-COMPREHENSION

Authors: J.M. Wepman
A. Morency

Publisher: Western Psychological Services
Publishers and Distributors
12031 Wilshire Boulevard
Los Angeles, Calif. 90025

Cost: $9.50 manual, test forms

Age Range: 5 to 8 years

Date: 1973

Administrative time: 10 minutes

Purpose: To test the ability to recall single syllable spoken words in progressively increasing series.

Description

Procedure. The examiner says a series of words and the child repeats them. The examiner speaks each series with a one-half second pause between each word. If the child succeeds on any one of these series of a given length then proceed with the test. If the child fails all three series of any length then discontinue the test.

Scoring. A response is correct if the child repeats just the words read to him and a response is failed only if words are added or omitted. Total the credits and see where the score obtained places the child on the rating scale.

Norms. The norms are found in the standardization and interpretation table which contains norms for 5, 6, 7, and 8 year olds.

Comments. This is a relatively new test and has received very little attention. It is certainly a welcome addition because it changes our auditory memory span testing from digits which have been traditional to single syllable words which is probably more appropriate. Children seem to enjoy the test and it is descriptive of their abilities.

THE AUDITORY SEQUENTIAL MEMORY TEST PHONOLOGY-COMPREHENSION

Authors:	J.M. Wepman A. Morency	Publisher:	Western Psychological Services Publishers and Distributors 12031 Wilshire Boulevard Los Angeles, Calif. 90025
Cost:	$9.50	Age range:	5-8 years
Date:	1973	Administration time:	10 minutes

Purpose: To test auditory recall and how this is related to general conceptual development.

Description

Procedure. The sequences of numbers are presented to the child. The digits should be read at the rate of one per half second. If the child succeeds on one of two sequences then proceed with the test. Discontinue the test when the child misses both sequences of a series.

Scoring. Each trial is credited with the value equal to the length of the series of digits. Total the credits the child received for exact reproductions and compare the score to the norms.

Norms. Norms for 5, 6, 7, and 8 year olds are provided. Normative data are not reported for ages over 8 years since this perceptual process should be attained prior to a normal child's 9th birthday.

Comments. This test represents a formalization of the digit span test procedures of a number of intelligence tests. Sequential memory is a prerequisite skill for most language and academic skills. Children seem to enjoy digit span procedures and it is easy to compare their ability with the normative data on this test. There is still some question as to the relevance of digit span memory to memory for sequential speech stimuli.

Appendix C. MORPHOLOGY & SYNTAX TESTS

NORTHWESTERN SYNTAX SCREENING TEST (NSST)

MORPHOLOGY & SYNTAX-PRODUCTION & COMPREHENSION

Author: Laura L. Lee

Publisher: Northwestern University Press
1735 Benson Ave.
Evanston, Ill. 60201

Cost: $10.00

Age Range: 3 to 8 years

Date: 1969

Administration time: Approx. 15 minutes

Purpose: To isolate children sufficiently delayed in syntax to need intervention.

Description

It is to be used only as a screening measurement. It tests both expressive and receptive syntactic forms by using the same linguistic structures of increasing difficulty.

Procedure. A demonstration page is provided for each part of the test. The examiner may invent his own cautions. These should be used until the child understands their instructions. For the receptive items, the examiner should say something similiar to the following: "I'm going to tell you about these pictures. When I'm done you show me the right picture. Look at the picture. Don't point til I tell you. The cat is behind the chair.* Show me the cat is under the chair.*" (child points) "Now show me The cat is behind the chair." (child points). Continue through all receptive items. Elicit asterisked sentence of each pair first. For the expressive items the examiner should not identify the pictures by pointing to them, but should say something similiar to the following: "I will tell you about these pictures. When I am done you copy me. Say just what I say. Ready? Listen. The baby is sleeping.* The baby is not sleeping What is this picture?" (examiner points to asterisked picture and child replies) "Now what is this picture?" (examiner points to the remaining picture and child replies. Continue through all expressive items.

Scoring. A score of 1 is given for each correct sentence. If both items in the pair are correct the score will be 2; if only one is correct the score will be 1; if neither are correct it is scored 0. Scores for each pair should be entered in the box to right of columns. The total scores for both parts should be added and recorded at the bottom of each scoring column. Correct expressive answers should be exact repetitions of the examiner's model. Replies which alter the sentence insignificantly and preserve the grammatical correctness may be scored correct. For example:

Ex.: The baby is sleeping.
Child: He is sleeping. (score correct)

However, any other grammatical error would cause the reply to be judged incorrect.

Ex.: The baby is sleeping.
Child: Him is sleeping. (score incorrect)

Incorrect replies to the expressive items should be noted by crossing out omitted words and word endings or otherwise changing the printed sentences on the record form to read exactly as the child replied.

Norms. Test was standardized on 242 children from ages of 3-0 to 7-11. They were from middle income and upper middle income families where only the standard American dialect was spoken. There were 111 males and 131 females. The score yields a percentile ranking. If the child falls below the 10th percentile, he should be studied further and be considered for a remedial language training program.

Comments. The NSST is a popular test among speech and language clinicians. It is a reliable screening instrument for children with receptive or expressive syntactic delay. Because it assesses both reception and expression it can be used to compare facility in these two processes in the same child.

BERRY-TALBOTT EXPLORATORY TEST OF GRAMMAR   MORPHOLOGY-PRODUCTION

Authors:	M. Berry R. Talbott	Publisher:	Mildred F. Berry 4332 Pinecrest Road Rockford, Illinois 61107
Cost:	$12.00 30 stimulus plates, test forms	Age Range:	5-8 years
Date:	1965	Administration time:	10-15 minutes

Description

Unlike the title suggests this test is limited to the major aspects of English morphological rule. The Berry-Talbott test is closely patterned after the research of Berko (1958) on the child's learning of English morphology. Berry and Talbott use Berko's argument that by the use of nonsense words we can ascertain whether or not the child has internalized a system of morphological rules and by the same token they avoid memory factors that could enter if real words were used. The Berry-Talbott test covers exactly the same areas as the Berko study does: 1. The plural and the two possessives of the noun. 2. The third person singular of the verb. 3. The progressive and the past tense. 4. The comparative and superlative of the adjective, and in some cases it borrows some of the nonsense words using different pictures.

Procedure. The procedures used in the administration are of the completion type in which the child is asked to attend to a series of statements and then he is asked to finish the sentence supplying the last word.

Scoring. No numerical scores are suggested but observation of items missed should provide a pattern to detect the presence or absence of a given morphological rule.

Norms. No attempt has been made to secure normative scores from various age levels based on normative samples.

Validity, reliability and predictive value. Dever (1972) after applying the test to a group of mentally retarded children, concluded that this revised version of Berko's test of morphology did not predict the occurrence or nonoccurrence of errors in the free speech of mentally retarded children. No validity or reliability data are reported.

Comments. The Berry-Talbott provides a commercially available for Berko's Test but that is about all. There is still no standardization of the procedure. It can serve as a diagnostic measure to see with which structures an individual child has difficulty.

CARROW ELICTED LANGUAGE INVENTORY (CELI) MORPHOLOGY & SYNTAX-PRODUCTION

Author:	Elizabeth Carrow	Publisher:	Learning Concepts 2501 N. Lamar Austin, Texas
Cost:	$40.30, Manual, training tape, score sheets, verb protocals	Age Range:	3.0-6.11
Date:	1974	Administration time:	30-45 minutes

Purpose: To provide a means for measuring a child's productive control of grammar.

Description

The CELI is based on the technique of elicting imitations of a sequence of sentences that have been systemically developed to include basic sentence construction types and specific grammatical morphemes. This test provides a means for measuring a child's productive control of grammar. The test contains 51 sentences and one phrase that range in length from two to ten words. The sentences are read to the child and he is asked to repeat each sentence. The child's responses are to be recorded on audiotape and scored on a special form from the tape. Of the 51 sentences, 47 are in the active voice and four are passive. The sentence modalities include declarative statements; negatives; imperatives; yes-no interrogatives; and wh- questions. The following grammatical categories and features are evaluated: articles, adjectives; nouns, singular and plural; pronouns; verbs; negatives; prepositions; adverbs; contractions; demonstratives; and conjunctions.

Procedure. The examiner presents a stimulus sentence and the child responds by repeating the sentence. The test is given live voice and taped for future scoring.

Scoring. Scoring is done according to five categories: substitutions, omissions, additions, transpositions, and reversals. Included with the test is a verb protocol which analyzes verb errors.

Validity ahd Reliability. Using Developmental Sentence Scoring the validity of CELI was -0.79. The produce-moment correlation coefficient between age and total scores were -0.62. Reliability included test-retest reliability of 0.98 and interexaminer reliability in transcription of language responses from audiotape of 0.98.

Norms. The normative sample consists of 475 white children between the ages of 3.0 and 7.11 years. These children were drawn from middle-socioeconomic level homes in Houston, Texas in which standard American English was the sole language spoken. Children with apparent speech or language disorders were excluded.

Comments. This is a relatively new test and has not seen a great deal of use as yet. It is in a sense an attempt to put information learned about imitation in children into a formal test structure.

Restrictions. The CELI should not be used when the child exhibits misarticulation so severe as to interfere with intelligibility, severe jargon speech, or severe echolalia. There are special rules for testing children with mild to moderate articulation errors.

PICTURE ARTICULATION AND LANGUAGE SCREENING TEST (PALST)

PHONOLOGY, MORPHOLOGY
& SYNTAX-PRODUCTION

Author: William C. Rodgers

Publisher: Word Making Productions, Inc.
P.O. Box 1858
Salt Lake City, Utah 84110

Cost: $16.00

Age Range: 1st grade children

Date:

Administration time: 1½ minutes

Description

The PALST test 27 different phenome in the initial screening portion and then tests seven most frequent misarticulated sounds in the sound evaluation portion. It also elicites sentences and phrases from picture stimuli to determine language formation abilities.

Procedure. The child is instructed to respond to the pictures. The clinician then presents the first picture, holding it about eye level so that the child must look up and present a good view of his mouth and the manner in which he articulates. In initial screening, the picture stimuli elicits sentence responses. An estimation of the child's language abilities is made, along with the evaluation of his articulation. During the initial screening, stimuli for 27 different phonemes are presented in 6 pictures. If the child passes this section, there is no need to continue. The sound evaluation portion of the test presents stimulus pictures designed to elicit sounds in the initial and final positions in single words. In the stimulus material section, 3 pictures are presented to evoke a sound in isolation.

Scoring. Scoring for the language portion of the test: 2 points for the + column; 1 point for the √ column; and 0 for the - column. If the total score is 8 or below, further investigation of language abilities is warranted. A score above 8 indicates that no further follow-up is necessary. Articulation is scored in the standard manner in the first six columns which have sound headings. Substitutions ex. 0/s, substitution first. Omissions - Additions + Distortions are described by adjectives. An additional observation column is provided so that the clinician may make note of any anomalies observed.

Reliability and Validity. No reliability data are reported. The PALST was compared with the Templin-Darley screening Articulation Test and the Riley Articulation and Language Test with 4,000 first graders. Using chi square comparisons, a level of confidence was achieved beyond .001.

Comments. The PALST takes very little time to administer and is designed to be used in the classroom. The score sheet is very simple. The stimulus pictures are clear and colorful. The test is very easy to administer.

ENVIRONMENTAL LANGUAGE INVENTORY (ELI) MORPHOLGY & SYNTAX VOCABULARY & BASIC CONCEPTS - PRODUCTION

Authors: J.D. MacDonald
M. Nichols

Publisher: The Ohio State University
The Nisonger Center
1580 Cannon Drive
Columbus, Ohio 43210

Cost: $8.00

Age range: Early multiword constructions stage

Date: 1974

Administration time: 30 to 45 minutes

Purpose: To serve as a model for the diagnosis and training of children with severe delay in expressive language.

Description

The ELI consists of procedures to assess expressive language in three modes -- conversation, imitation, and play. Conversation and imitation are evaluated in a single procedure. A separate procedure is provided for assessment in free play. Both procedures can be administered on a single occasion; individual recording and scoring forms are available for each procedure.

Scoring. The range of scores available from the ELI are as follows: 1) semantic-grammatical rules; 2) utterance length, and 3) intelligibility. Before scoring the ELI, the examiner should decide which scores are of concern for experimental or diagnostic purposes. All possible scores will not usually be needed for a given client.

Comments. This semantically based assessment model is especially appropriate with young children. It is especially encouraging because an attempt to asses language within natural contexts.

DEVELOPMENTAL SENTENCE TYPES(DST) MORPHOLOGY SYNTAX-PRODUCTION

Author: Laura Lee
Publisher: Lee, L. Developmental Sentence Analysis, Northwestern University Press, Evanston, Ill.

Cost: $13.50 Book
Age Range: children speaking in pre-sentences

Date: 1974
Administration time: variable

Purpose: To provide the clinician with progressive goals in planning easily remedial procedures and a way to estimate a child's progress at periodic intervals during language training.

Description

DST is a classification system which presents a more systematic way of studying and evaluating grammatical development in children who are still speaking largely in pre-sentences.

Procedure. Lee defines a pre-sentence as an utterance which does not include a subject and a predicate. If fifty percent of a child's utterances contain a subject and a predicate the DST procedure is not applicable and the analysis should be done according to DSS procedures.

In 1966 Lee's publication provided a level for basic sentences and a level for sentences with transformations, however since the revisions explained in Developmental Sentence Analysis pre-sentences and sentences are separated and scored according to DST and DSS.

Fragmentary remarks which have meaning but depend upon the previous speaker's utterance to contain the longer grammatical structure and presumedly the deep structure as well are termed elliptical sentences. In the DST classification no separation is made between eliptical sentences and truly immature grammatical forms. Lee's reasoning for this is that the child is relying on the previous speaker's utterance and may be incapable of expanding his utterance into a complete sentence even if he were given the opportunity to do so.

Pages 86-87 of Developmental Sentence Analysis contain the chart used in DST classification. The classification system is divided horizontally and vertically into categories. The vertical classification is designed to determine whether a child is developing a variety of sentence types in his grammatical rules rather than just one stereotyped sentence form.

The first column in the vertical classification is divided into nouns at the single word level to noun elaboration in the two word combination and construction levels. This column is used to show the development of the noun phrase which must be incorporated with other sentence types to form a complete sentence. The second column in the vertical classification shows the development of the designative sentence which begins with designative words at the single word level to designative elaboration at the two word combination and construction levels. Designative words name the topic of the sentence without adding a comment. Designative sentences begin with words such as this, that, here and there. The third column of the vertical classification shows the development of the predicative sentence which names the topic of the sentence and then precedes to "predicate" something about it. Lee mentions that the term predicative may be misleading since the term predicate often refers to verbs and all sentences are composed of subjects and verbs. She retained the term since it was used in the original classification system. Predicative sentences differ from designative sentences because the predicative sentences contain both a topic and a comment while the latter name only the topic. The comments may be adjectives, a noun phrase, prepositional phrases or locatives such as here and there. The verb is always the copula in the predicative and designative sentences. The fourth column in the vertical classification shows the development of the subject-verb sentence. The noun (or the topic of the sentence) is in grammatical relation to the verb. The verb is always a lexical word and not the copula. The grammatical object is optional. The fifth vertical column is the fragment column which contains all utterances which are appendages to the three main sentence types (designative, predicative and subject-verb). Utterances which contain neither the subject or the predicate are classified here, prepositional phrases for example.

The horizontal classification contains three levels: 1) single words 2) two word combinations 3) constructions. Single word utterances are classified according to the type of sentence which will evolve from them. The DST chart allows the clinician to observe use of higher grammatical features through subcategories within the larger categories. Simpler utterances are placed higher within a large category than more developed forms which are placed lower. For example, in the category of nouns, single nouns are placed higher than pluralized nouns to show the increased knowledge of pluralization. Two word combinations, the second horizontal level, also treat utterances as earlier forms of emerging sentences. Within the two word combination category the clinician can view to what extent variety of forms is demonstrated. Simpler utterances are placed higher than more difficult forms as they are in the construction level also. Constructions are the third level in the horizontal classification. Constructions are placed beneath the single word and two word combination levels since they are longer and usually more highly developed forms occur here than in the other two categories. Three word utterances and beyond are placed in the construction category. Length differentiation is not made beyond the three word level since the clinician is interested in the grammatical complexity of the utterances rather than their length. Added complexity usually results in increased length so length of utterances is indirectly accounted for.

Analysis of DST. Lee states that one way to analyze the data on the DST chart is to count the number of utterances at the single word level, the two word combination level and the construction level. This gives the clinician an estimate of the length of utterances, however this alone does not provide much insight into the grammatical complexity of the utterances.

The DST procedure places the language corpus into an easily readable chart which is useful provided the clinician is skillful enough to interpret it meaningfully. The vertical classification fulfills its purpose of allowing the clinician to determine if the child is developing many different grammatical forms or merely one or two stereotyped forms. The divisions within the categories also make it relatively easy for the clinician to determine if the child is developing increasingly more difficult grammatical features.

The chart on pages 86-87 contain numerous examples; further examples and definitions of the categories and divisions within the categories are presented in the chapter allowing even an inexperienced clinician to use the procedure efficiently.

Comments. The DST could be a useful clinical tool if the original DST obtained on a child was compared with a new DST after intervention to determine if intervention had been effective and if further development had occurred. The DST does not result in an overall score as the DSS procedures do. The majority of research on reliability and validity and normative data available are relevant to DSS only. Although too much data on norms, percentiles, etc., can become a hindrance to the clinican if she relies too heavily on them and does not interpret the sample collected relative to a particular child, it appears that more normative data is needed concerning the DST so the clinician has the opportunity to determine if a child is developing normally with regard to grammatical development or not. This will be difficult to obtain until the elicitation procedures, stimuli, examiner and situational variables are controlled and standardized. These variables need to be considered very seriously when interpreting data collected according to DST. An initial drawback to DST are Lee's instructions regarding the collection of a language sample which tend to be more readable than practical. Bloom commented on Lee's utilization of source material to obtain a sequence of DST and secondly the methods for applying this sequence diagnostically from a comparison of speech samples collected from two children, one developing normally and the second "a language delayed child". Regarding the first criticism she states that Lee "simply paired traditional grammatical functions with groups of utterances reported in the literature without regard to the function of the utterances as they occur." Page 83 of Developmental Sentence Analysis presents the example Bloom used to develop her argument, reading it clarifies the issue. Lee's reply is essentially that DST was designed as a clinical tool and not as a psycholinguistic analysis of normal children's utterances so examples such as those cited by Bloom would rarely if ever occur in a clinical child's speech. Regarding Bloom's second criticism, she states that the qualitative differences between the language samples of the two children. Longhurst and Schrandt analyzed and compared four current linguistic procedures used in assessment of the language development of children. Regarding the DST the authors concluded that it provides an accurate means of discriminating between the development of two childrens' language samples however it was no more informative than simply classifying the childrens' utterances by levels of development and not transformational as Lee claimed. They felt DST paired traditional (naming) and structural (levels) grammatical functions with groups of utterances without regard to the function of the utterances.

DEVELOPMENTAL SENTENCE SCORING(DSS) MORPHOLOGY & SYNTAX-PRODUCTION

Author: Laura Lee

Publisher: Lee, L. Developmental Sentence Analysis, Evanston, Ill., Northwestern University Press, 1974.

Cost: $13.50 Book

Age Range: children speaking mostly in sentences approximately 2.0 to 7.0

Date: 1974

Administration time: variable

Description

A modification has been made from the original DSS version (Lee and Canter, 1971) to formulate the Reweighted DSS (Lee, 1974). A reciprocal averaging technique resulted in a reassignment of weights (scores) to the structures within each category in such a way that grammatical growth could be compared across categories, not only within categories. For example, while and was the first conjunction to appear, it was later to develop than many pronouns and some verb tenses. Thus, and was weighed more heavily by the reciprocal averages technique (a weight of 3) than it had been in the original DSS (a weight of 1). (The order of structures in each grammatical category does not differ from the original DSS version.

The present version of DSS can be interpreted as a more complete model of grammatical growth than the original version because development across categories is taken into account.

Procedure. A sample of the child's spontaneous speech is tape recorded and analyzed. For the children between the ages of 3.0 to 6.11 the last fifty consecutive utterances are scored. An utterance is considered a sentence if it contains a subject and a predicate. Language samples for children age 2.0 to 2.11 consisted of the last 100 utterances. Since some children were not producing the required 50 sentences for DSS treatment, a developmental sentence type classification was made of the presentences and a tentative DSS was derived from whatever number of complete sentences remained.

Scoring. Since scoring every individual feature of a child's language sample would be so time-consuming as to be impractical, eight features have been selected based upon their early appearance in children's language and their developmental progression. Weighed scores were assigned to later-developing forms. The eight features scored are: 1) indefinite pronouns and/or noun modifiers, 2) personal pronouns, 3) main verbs, 4) secondary verbs, 5) negatives, 6) conjunctions, 7) yes/no questions, 8) Wh questions. To account for unscored grammatical items (articles, plurals, possessives, prepositional phrases, adverbs, word order, etc.), an additional sentence point is added to the total sentence score if the sentence is correct in all respects.

e.g. A apple fell off the tree. no points
An apple fell off the tree. 1 sentence point

The DDS is estimated by totaling the points and dividing by the number of sentences (50).

Reliability and Validity. High reliability coefficients were obtained by the Reweighted DSS. The overall internal consistency of the instrument as measured by Coefficient Alpha was 0.71. The within-subject internal consistency of the scoring procedure resulted in an overall estimate of reliability of 0.73. Repeated applications of the DSS scoring technique indicated that the procedure can be used with different stimulus materials, within the interest range of the child, with consistent overall results. Lee suggests the validity of the DSS measure has been indicated by the significant differences produced between age groups by the overall scoring procedure and by each of its component grammatical categories. As age level increased, the scores which purported to measure syntax and morphology usage increased systematically, indicating that grammatical development was being measured.

Norms. Norms were established on a sample of 200 children between the ages of 2 0 and 6.11. All children were from monolingual homes where Standard English was spoken and all except two were from middle income homes. All children obtained IQ scores between 85 and 115 on the Peabody Picture Vocabulary test. (An extrapolated set of criterion were used with the two-year-old range because the PPVT norms do not extend that low). Below are the norms derived from the sample.

THE INDIANA SCALE OF CLAUSE DEVELOPMENT(ISCD) MORPHOLOGY & SYNTAX-PRODUCTION

Authors:	Richard B. Dever Patricia M. Bauman	Publisher:	Linguistic Analysis of Children's Speech: Readings. Ed. Thomas M. Longhurst. New York: MSS Information Corporation, 1974. pp. 280-320.
Cost:	Book $5.95	Age Range:	Children speaking in clauses
Date:	1974	Administration time:	

Purpose: To classify the spontaneous linguistic performance of very young children, chronological age 18-40 months, through grammatical categories with rules to define the categories.

Description

The scale was designed to classify in terms of language patterns and not development of children. The scale was also designed for children who speak standard English and the authors suggest that if the scale is used for children with dialects, judgements of rank should be made by someone familiar with that particular dialect.

The ISCD classifies clauses into three types:
Declarative, Question and Imperative. Then they are ranked into form categories:
- I--consists of one or two word utterances.
- II--consists of more than two words and must contain at least one obligatory tagmeme. (Subject, predicate, or complement).
- III--utterance contains all nuclear obligatory tagmemes whether or not they are in their correct sequence.
- IV--contains all nuclear obligatory tagmemes and a reordering transformation takes place; either the passive transformation on declarative and question clauses or the question transformation on the question clause.

The classification and ranking are then inspected and the overall development of the child within the ranks can be determined.

CO-OCCURRING AND RESTRICTED STRUCTURE PROCEDURE (CORS)

MORPHOLOGY & SYNTAX-PRODUCTION

Author: John R. Muma

Publisher: Muma, J.R. Lanugage Assessment: The Co-occurring and restricted structure procedure. Acta Symbolica, 1973, 4 12-29.

Cost:

Age Range: variable

Date: 1973

Administration time: variable

Purpose: To identify and describe which grammatical systems a person is in the process of acquiring. This identification and description is in terms of co-occurring and restricted structures.

Description

The first step is that of choosing target structures or systems. Any grammatical structure or system can be chosen. Clinicians should select a target structure on the basis of a preliminary examination of representative language samples. In this way, they can direct their focus to those grammatical systems in which a client has difficulty. The probabilities of appropriate selection of one target will, at some point, be relevant to other potential targets because the underlying systems are integrated. Generalization from one target to another is expected to happen.

There are three main points concerning relevance of a target structure:

1) A target structure must be a grammatical system rather than a product of grammar.
2) An initial target selection can serve to direct assessment and intervention to other specific grammatical systems by virtue of emerging patterns of co-occurring and restricted structures.
3) Clinicians have the prerogative of choosing as many target structures as needed for directing the nature and course of intervention.

The selection of target structures is open. The determining factor is the nature of available evidence rather than a predetermined set of structures preferred by a clinician or contained in norms.

Following selection of a target structure, all utterances containing the target are separated out for study. These utterances should be grouped by sentence type. Within these types, systematic descriptions of co-occurrences can be made. And the patterns of restricted and adult structures for these co-occurrences describe the level of attainment.

Grammatical co-occurrence pertains to those structures that co-exist in structural relationships to each other. Co-occurring structures are any that have a contextual relationship to a target structure. A pattern of co-occurrence for a target structure would indicate the contextual effects of certain adjacent structures, sentence frame types, levels and types of modification, etc.

Restricted structures show partial learning. Child utterances typically do not contain errors; they are simply the result of grammatical rules that are not as fully defined as adult rules. A child has limited or restricted knowledge in comparison to an adult. Accordingly, children's utterances are restricted structures rather than errors. They move through a series of stages in progressive approximation of adult grammatical knowledge. Menyuk (1964) showed that children progress from omissions to substitutions to redundancies to adult forms. Restricted structures identify which systems and particular dimensions of systems in which mastery is in progress. The type of restricted structures identifies the status of progress.

LANGUAGE SAMPLING, ANALYSIS, AND TRAINING MORPHOLOGY AND SYNTAX-PRODUCTION

Author: Dorothy Tyack
Robert Gottsleben

Publisher: Consulting Psychologists Press
577 College Ave.
Palo Alto, California 94306

Cost: $3.25

Age Range: Variable

Date: 1974

Administration time: Variable

Purpose: To establish specific intervention procedures by analyzing a sample of spontaneous spoken sentences.

Description

Procedure. Eliciting and transcribing language samples

A. Obtain a sample in a systematic manner so comparisons between samples will be meaningful
  1. Present visual stimuli (pictures) in the same order for each sample
  2. Use open-ended questions ("Tell me about this") rather than asking direct questions ("What is happening?")
  3. Expand child's utterance based on contextual information and syntactic information
  4. Collect 100 sentences
  5. Tape-record the session

B. Transcribing the sample on the Transcription worksheet using three line format:
  a. top line: direct questions asked by the clinician
  b. middle line: child's utterance exactly as he said it
  c. bottom line: expansion of the child's utterance

Analyzing the Sample

A. Count words and morphemes and write word and morpheme count to the left of each sentence
B. Calculate the word and morpheme mean
C. Assign the sample to a linquistic level
D. Sort the forms and constructions
  1. Forms
    a. Fill out Sequence of Language Acquisition (SLA)
    b. On transcription sheet circle forms and check all form omissions
  2. Constructions
    a. Write construction type (N+V+N) above sentence on Transcription Sheet
    b. Enter the sentence number in the appropriate space on the SLA
E. Enter in appropriate categories on the Baseline and Goal Analysis Worksheets the data obtained on SLA.
  1. Baseline: structures child uses correctly
  2. Goal Analysis: structures child needs to acquire

Training Programs

A. Selecting training goals
  1. Goal Analysis provides 3 categories
    a. Category D = do not appear at or below the assigned level
    b. Category E = inconsistently appear at or below the assigned level (appear less than 90% in obligatory context)
    c. Category F = inconsistently appear above assigned level

B. In deciding on a training goal consider:
  1. Linguistic level-choose structures at lowest indicated level
  2. Frequency of obligatory occurence of a form
    a. choose structures which most closely approaches the 90% occurence level
  3. Semantic or conceptual need
    a. choose structures that the child needs in his productive system

C. When choosing a goal from Category D, test non-obligatory structures before writing a training program to determine if the child can use the structure but did not under the particular sampling procedure.

D. Write training programs using behavioral objectives for defining the behavior to be trained.

Comments. This is very individualized in that training goals are selected from the child's spontaneous speech rather than from scores on a standardized test. It considers frequency of occurence of a structure in establishing training goals. The booklet is very explicit and the procedure for eliciting speech samples is especially helpful. The procedure is quite time-consuming; may be too time-consuming for public school clinicians with a heavy caseload.

LENGTH-COMPLEXITY INDEX(LCI) MORPHOLOGY AND SYNTAX-PRODUCTION

Author: L.E. Miner

Publisher: Scoring procedures for the length-complexity index: a preliminary report. Journal of Communication Disorders, 1969, 2, 224-240.

Cost:

Age Range: 5 and older

Date: 1969

Administration time: Variable

Purpose: To make a Composite analysis of sentence length and sentence complexity.

Desctiption

Both length and complexity are considered together not independently according to a numeric weighing system. LCI is basically a measure of verbal maturity to be used with children 5 years old and older. LCI is a modified combination of McCarthy's MLR and Templin's SCS. The modifications were based on Menyuk, Cazden and Bellugi's work. Their work is basically an adaptation of Chomsky's second generation phrase structure rules of his transformational generative grammar.

Phrase structure rules in transformational generative grammar were conceived under the assumption that human speakers when producing their native language generally speak in sentences and that sentences can best be characterized as consisting of two nuclei: Noun Phrase (NP) referring to some kind of actor or agent and Verb Phrase (VP) dealing with the doings of that actor or agent.

Procedure. Language samples are collected from the subject. No standardized method is presented but a representative sample should be collected. Griffith and Miner have shown that as few as 15 sentences can be a reliable sample. Normally 50 sentences out of 60 collected should be used. LCI scores points for morphological complexity, adjective transformations, conjunctions and question and negative transformation. Formula to compute LCI $LCI = \frac{NP + VP + AP}{NS}$. In general the NP LCI is sensitive to morphological changes singular vs plural, possession, articles and up to two adjectives. On the other hand the VP is sensitive to preverbals to agreement and it includes AUX with Modal tense, perf, prog. Additional points are given for negation, questions and the conjuctions and, but and so. AP points are given for these simple transformations and a scale of complexity permits additional points for more complete and adult-like structures.

Reliability. Test retest reliability was shown by Barlow and Miner to be fairly high for the LCI. Although the intent of the LCI is to analyze a child's grammatical rules for his deep structure, not his surface structure, in actual fact the criterion for sentence is not based on meaning or a complete thought but rather the contiguity of two constituents NP+VP. Meaning basically deep structure is not considered explicitly. LCI is a measure of surface structure complexity.

Comments. The application of the LCI is relatively complicated and even though the guidelines provided are clear, some individual sentences may be difficult to score. Also, no provisions are made for ungrammatical utterances that may be the result of deviant rules and not of language delay. A general LCI score would not show these differences. The utility of the LCI for language intervention comes more from the linguistic analysis performed on NP, VP and AP than the numerical score useful perhaps for research purposes.

SKI-HI RECEPTIVE LANGUAGE TEST

SYNTAX-COMPREHENSION

Authors: Thomas M. Longhurst
Deb Briery
Mary Emery

Publisher: Unpublished, available from:
Dr. Tom Longhurst
Speech Department
Kansas State University
Manhattan, Kansas 66506

Cost: $25.00

Age Range: Approximately 2-5

Date: 1974

Administration time: Variable, approximately 10-15 minutes

Purpose: To probe the handicapped child's ability to comprehend single word utterances as well as two, three, and four word utterances. It is intended to be readministered at three month intervals throughout the child's language development.

Description

The Ski-Hi was developed for use with young hearing impaired and deaf children. It tests 100 care vocabulary items divided into five "critical element" categories in conceptual groups such as clothing, foods, farm animals, etc. Comprehension of two, three, and four critical elements is also tested.

General Procedure. The child is informed that he is going to play a game and that he must use his finger to point. The child is then instructed to "Look at all the pictures," and then to "Point to _____" or "Show me _____." If the child does not respond appropriately, model the response for him. The responses to the training items must be correct before proceding to Part A. If the correct response is not obtained, try again in the next testing session.

Procedure PART A. Consists of 100 core vocabulary items. There are 20 plates with five pictures per plate. Categories tested include agents (animate nouns), objects (inanimate nouns), actions (verbs), attributes (modifiers), and relations (prepositions). All of the pictures on one plate belong to one conceptual category, such as body parts, etc. Present three items per plate. When the category is completed, go back and test the remaining two items on each plate. If the child fails, but you suspect comprehension, duplicate the plate(s) using real objects. Fifty percent of the agents and objects must be correct before proceding to the actions. Fifty percent of the actions must be correct before proceding to the attributes, and fifty percent of the attributes must be correct before testing relations. The total score for Part A must be seventy percent before beginning Part B.

Scoring PART A. Place a + or - in the blank by the word on the record form. Figure the percentages for each category in the spaces provided. Record the percentage for each category on the data sheet.

Procedure PART B. Consists of two element items. The following combinations are used: agent + agent; agent + action; and attribute or object + agent. There are 10 plates with four pictures per plate, and one response per plate.

Scoring PART B. Circle the number on the answer sheet that corresponds to the picture the child pointed to. Figure the percentage for Part B on page one of the response sheet, and enter the percentage in the graph on the data sheet.

Procedure PART C. Consists of three element items. There are 10 plates with four pictures per plate and one response per plate. The following combinations are used: agent + relation + object; attribute + agent + action; agent + agent + action; and agent + action + object. Scoring is the same as Part B.

Procedure PART D. Consists of four element items. There are 10 plates with five pictures per plate and one response per plate. The following combinations are used: agent + action + attribute + object or agent; agent + action + relation + object; attribute + attribute + agent + action; agent + agent or object + relation + object; and attribute + object or agent + relation + object. Scoring is the same as Part B.

Readministration. The test was designed to be readministered periodically. There is a score form to record each readministration. When readministering, begin with some success items from the last administration. Then probe the items that were failed, and then probe new items.

Reliability and Validity. No reliability or validity data are reported.

Norms. Since the test is designed to assess language change in a single child across time no normative data were included with the test.

Comments. The test plates for the Ski-Hi are very large and mounted on heavy cardboard. The pictures are colorful and present a cartoon-like appearance. Young children seem to enjoy taking the test. Since there are 100 core vocabulary items it is possible to identify specific areas of strength and weakness in a given child. The data sheet used to record total percent correct in the five categories of Part A and for Parts B, C, D allow the examiner to chart progress of the child across successive test administrations.

TEST FOR AUDITORY COMPREHENSION OF LANGUAGE (TACL)

MORPHOLOGY & SYNTACTIC-COMPREHENSION

Author:	Elizabeth Carrow	Publisher:	Learning Concepts 2501 N. Lamar Austin, Texas 78705
Cost:		Age Range:	3.0-6.11
Date:	1973	Administration time:	20 minutes

Purpose: To measure the auditory comprehension of language structure.

Description

Procedure. The Test for Auditory Comprehension of Language is designed for administration in a one-to-one setting. The test booklet is placed with the illustrations facing the child and the stimuli to be read aloud facing the examiner. No language expression is required of the child; he points to the correct picture in the test booklet in response to the examiner's verbal stimuli. His responses are recorded on a separate scoring sheet rather than in the test booklet itself.

Scoring. Each correct response is given one point and the total raw score is the sum of these points. The total raw score may be converted to an age score or may be used to compare a child's performance with that of other children by using measures of central tendency. Normative data for this test can be found in the TACL manual.

Comments. This is a popular test that is well constructed and standardized. It is one of the most complete tests of its classification.

ASSESSMENT OF CHILDREN'S LANGUAGE COMPREHENSION(ACLC) MORPHOLOGY & SYNTAX-COMPREHENSION

Authors: R. Foster
J. Gidden
J. Stark

Publisher: Consulting Psychologists Press, Inc.
577 College Avenue
Palo Alto, California 94306

Cost: $42.25 stimulus plates, manual, record sheets

Age Range: 3.0 to 6.11 years

Date: 1969, 1973

Administration time: 10 minutes

Purpose: To determine the number of elements which a child can process as well as the nature of his difficulty. It attempts to provide a more precise description of the level at which the child is unable to process lexical items.

Description

The test consists of four levels of difficulty beginning at the one critical element level. At this level the child is required only to identify common count nouns, the present progressive form of verbs, some prepositions and adjectives. At the next level, there are two critical elements, and the child is required to understand the relationship of these items. For example, one plate shows a picture of a cat walking, a cat sitting, a horse sitting and a horse walking. The examiner asks him to point to the "cat walking". The child must discriminate between cat, dog, man, as well as walking and sitting in order to select the correct picture. The third level contains three critical elements. A preposition is added and the stimulus items include units such as "ball under the table". At the highest level is four critical elements. Here the child must process the subject, which may or may not contain a modifying word, the verb, and the prepositional phrase.

Solid black figures on a white background are used (silhouettes) stimuli. Five pictures are shown on each plate. The first ten plates (single element level) contain five successive stimuli. For the remaining items only one response is required for each plate.

Procedure. Verbal and visual. The examiner says the stimulus item and the child is asked to point to the appropriate picture. A recording sheet divided into four sections is included: vocabulary, two critical elements, three critical elements and four critical elements. The examiner circles the child's response. The response is further categorized into four types: correct, first element incorrect, second element incorrect, both incorrect.

Scoring. Part A (Core Vocabulary): The number of correct items are totaled. If the child responds incorrectly to more than five of the items, the test should be discontinued. Training to teach these items should begin and once the child masters the core vocabulary, the test can be readministered.

Parts B,C,D (Comprehension of an increasing number of lexical items): Each section contains 10 items. A percentage score can be given on each section by dividing the number correct by 10 and multiplying by 100. If the child scores 70% or less it is recommended that training should begin at that level. In addition to a percentage score, a total raw score should be noted. This test attempts to define a starting point in training for a particular child. The level at which the child breaks down (scores 70% or less) is where remediation should begin. An error analysis has also been suggested by the authors to determine a) if errors are consistently made in the 1st, 2nd, 3rd, or 4th element in a phrase or b) if breakdown occurs at a particular level of critical element processing. Suggestion for remediation based on ACLC results can be found in the manual.

Reliability and Validity. Internal consistency was assessed by comparing the scores for odd and even numbered items. The correlation coefficients were .86 and .80 for Parts A, and B through D respectively. No discussion of validity is presented.

Norms. The normative group consisted of 365 nursery school and kindergarten children living in California or Florida. The greatest proportion of subjects were white. However, blacks, Asian-Americans, and Mexican-American children were represented. Mean percentage scores are presented by age at six month intervals from 3,0 to 6,11. The test authors recommend that these mean scores should be treated as suggestive only since they are based on the experimental edition (1969). Preliminary mean scores were also presented for children diagnosed as neurologically or educationally handicapped in these age groups.

THE MILLER-YODER TEST OF GRAMMATICAL COMPREHENSION (M-Y)
(EXPERIMENTAL EDITION) MORPHOLOGY & SYNTAY-COMPREHENSION

Authors: Jon F. Miller
& David E. Yoder

Publisher: unpublished, address correspondence to:
Dr. David E. Yoder, Chairman
Dept. of Communicative Disorders
University of Wisconsin
Madison, Wisconsin

Cost: unavailable

Age Range: 3 to 6

Date:

Administration time: 20-30 minutes

Purpose: To measure children's grammatical comprehension.

Description

The test consists of 42 sentence pairs to be identified by pointing in response to stimulus sentences. There are 42 plates, each plate containing 4 line drawings, 2 foils and 2 pictures identifiable from test sentences. The plates are gone through twice. Responses are recorded on the data sheet, which are then transferred to a Comprehension Test Results Form which indicates the categories that were missed. No raw score is obtained, and thus no percentile score or language age may be derived. There are no norms included, but a study has been made by N.O. Owings which includes reliability and age norms. He found that children comprehend grammatical forms later on the M-Y than on the Carrow, meaning that M-Y language ages would be lower than on the Carrow.

Comments. The M-Y provides useful information about receptive language skills of young children. It is however, awkward to administer--the plates are not bound, and not in numerical order. It is also awkward and time consuming to score and transfer results to analysis section. Generally children are bored with the test and sometimes rebel when asked to go through plates twice as is required.

COMPREHENSION TESTS FOR SYNTACTIC CONSTRUCTIONS   MORPHOLOGY & SYNTAX-COMPREHENSION

Author: Ursula Bellugi-Klima

Publisher: Some language comprehension tests. In (C. Lovateli, Ed.) Language Training in Early Childhool Education. Champaign: University of Illinois Press, 1971.

Cost: $4.00, Book

Age Range: unspecified

Date: 1971

Administration time: variable

Description

These tests are designed to assess children's comprehension of syntactic structures. The child is given familiar objects and toys and asked to act out a sentence spoken by the examiner. The syntactic structures tested are active sentences, singular/plural nouns, possessives, negative/affirmative statements and questions, singular/plural with noun and verb inflections, and adjectival questions, negative affix, reletivization, comparatives, passives, and self-embedded sentences. The test items themselves are only suggested examples and may be supplemented by the examiner.

Norms. This is not a standardized test, and normative data are not presently available.

Reliability and Validity. No information is provided.

Comments. This is an informal procedure but it is useful. Some often more structured or standardized test assess essentially the same structures.

Appendix D. VOCABULARY & BASIC CONCEPT TESTS

FULL-RANGE PICTURE VOCABULARY TEST (FRPV) VOCABULARY-COMPREHENSION

Authors: Robert B. Ammons
Helen S. Ammons

Publisher: Psychological Test Specialists
Box 1441
Missoula, Montana 59801

Cost: $7.50

Age Range: 2 years to adult

Date: 1958

Administration time: 5-10 minutes

Purpose: The FRPV is designed to provide an estimate of intelligence based on verbal comprehension.

Description

Procedure. The subject is instructed to point to the best picture of the four on a page to show what a word means. The subject can respond by pointing or by a yes-no. The presentation of words should be varied so motivation isn't lost. Words are given until three point-levels are passed consecutively and three failed. Point levels represent the mental age at which 50% of a representative population would fail the word.

Scoring. Each response is checked right or wrong as testing proceeds. Examiner can total number of items answered correctly and enter in the lower right hand corner of the test form. All items below the three passed consecutively are assumed to have been passed. An equivalent mental age is read directly from a simplified table on the back of the answer sheet. Wechsler-type norms for IQ equivalents can also be compared.

Norms. Standardization on a population of 589 children and adults. Norms on the back of the answer sheet. Separate norms set up for white farm children, Spanish-American children, Negro children and Negro adults.

Reliability and Validity. Is uniformly high, ranging for various groups from .86 to .99, with a median of .93. Validity is satisfactorily high. The test does not discriminate well at below the two-year level, or at the superior adult level. Validity is higher when both forms are administered.

Comments. The FRPV can test a wide range, and an alternate form may be given for repeated measurements. Since responses are non-oral it is appropriate for speech and physical handicapped. May be good for screening large populations. However there are few items in each age range. The pictures are small and overly detailed.

QUICK TEST VOCABULARY-COMPREHENSION

Authors: R.B. Ammons
C.H. Ammons

Publisher: Psychological Test Specialists
Box 1441
Missoula, Montana 59801

Cost: $8.00 manual and score forms

Age Range: 2 years-adult level

Date: not available

Administration Time: 3-10 min.

Purpose: To provide a quick, efficient estimation of general level of intellectual ability under less than optimum circumstances, and where time is at a premium.

Description

Three Plates each with four line drawings on it--one plate for each of the three 50-item forms. Testees at or beyond the 7th grade level are given a list of the words to look at. Record sheets and instruction manual.

Procedure. The tester asks the testee to indicate which of the four drawings on a plate best illustrates the meaning of a given word. Answers are usually given by pointing. Testing with a given form continues only until there have been six consecutive passes and six consecutive failures (this usually involves presentation of between 15-20 items). Responses are recorded on a special record sheet which lists the items, their correct answers, and their difficulty levels in a form convenient for the tester, and which also includes norm tables and space for other information related to the testing.

Scoring. Testee receives credit for all correct answers, regardless of whether or not he gives them for the "right" reasons. He also receives credit for all items below his level of six consecutive passes. Item responses are easily scored during the administration of the test.

Norms. A total of 458 children and adults made up the standardization group. Norms are given for each of the three forms of the QT separately as well as for each of the possible combinations of the three forms.

Reliability. Reliability of single forms (and therefore of combinations of forms) of the QT have been high, even under adverse testing circumstances. It should be noted further that, since the score on each of the forms of the QT is based on a very few highly selected items, one atypical testee can lower reliability estimates for a whole group greatly.

Validity. Comparisons of the QT and the Full Range Picture Vocabulary Test has given highly valid estimates of intelligence as indicated repeatedly by strong correlations with such tests as the Revised Stanford-Binet and the various Wechslers.

Comment. Since responses are non-oral it is appropriate for speech impaired or the physically handicapped. It is easy to administer.

PEABODY PICTURE VOCABULARY TEST VOCABULARY-COMPREHENSION

Author: Lloyd M. Dunn

Publisher: American Guidance Service, Inc.
Publishers Building
Circle Pines, Minnesota 55014

Cost: $12.00 Book of plates, Manual, test forms A or B

Age Range: 3-3 to 17-6

Date: 1965

Administration time: 10-15 minutes

Purpose: The PPVT is designed to provide an estimate of a subject's verbal intelligence through measuring his hearing vocabulary.

Description

Procedure. Directions to the testee should be read verbatum. Directions are provided in the manual for children below and above 8 years of age. The examiner should be careful not to let the subject see the printed words, to use them in sentences, to define or spell them. The examiner should never precede the word with an article or convert singulars into plurals. Praise should be given generously during the test to keep the subject motivated. The subject can use an oral pointing or yes-no response. The subject should be encouraged to guess if he won't respond and he may change a response if the change is spontaneous. Introduce the testing using the examples provided in the test manual then proceed to the plate where it is suggested to begin for the subject's chronological age. The examiner must find a basal of eight consecutive correct responses and a ceiling of six errors in eight consecutive responses. To record responses write the picture number on the score form. To establish easily the basal, ceiling and errors, indicate incorrect responses by drawing a line through the geometric figures.

Scoring. The raw score (number of correct responses) is derived by subtracting the errors from the last item presented. The raw score is converted to three types of derived scores, 1) mental age 2) intelligence quotient, and 3) a percentile equivalent.

Reliability. Wide ranges of ages among subjects tend to inflate correlations and using subjects falling within a narrow range on the intellectual continuum tends to reduce correlation. The studies are done before 1965 (which are in the manual) indicate satisfactory coefficients of equivalence and temporal stability for both average children and those with disability.

Validity. Measures were obtained both for individual items and for the total test. Studies indicate that the PPVT is not providing a comprehensive measure of intellectual functioning. There are the highest correlations with intruments most comparable to the PPVT and lowest with performance intelligence tests. It measures vocabulary and correlates highly with verbal IQ measures. Studies indicate the PPVT should be a better predictor from Grade 3 and on.

Norms. The PPVT was standardized on 4,012 cases, divided among different age levels. Both forms were administered by four examiners. Not less than 3 nor more than 7 days elapsed between administrations.

Comments. Since responses are non-oral it is appropriate for speech impaired, or handicapped individuals. It is quickly administered, covers a wide age range and the alternate forms of the test allows one to repeat measures. The pictures have clean bold line drawings but are small with four on a page. PPVT scores are often misused and aren't always valid.

BOEHM TEST OF BASIC CONCEPTS

BASIC CONCEPTS-COMPREHENSION

Author: Ann E. Boehm

Publisher: The Psychological Corporation
304 East 45th Street
New York, N.Y. 10017

Cost: $14.60 manual, 50 booklet 1, 50 booklet 2

Age Range: Kindergarten, 1st, 2nd grade

Date: 1969

Administration time: 15-20 min. for kindergarten classes

Purpose: To test the comprehension of 50 basic language concepts in young children.

Description

The test consists of 50 pictorial items which are arranged as best as they can be in order of increasing difficulty. There are two booklets each containing 3 sample questions followed by 25 test questions. Booklet 2 is more difficult than Booklet 1. Each item consists of a set of three pictures about which statements are read aloud to the child/children by the examiner. The statements describe and instruct the child/children to mark the one that illustrates the concept being tested.

Procedure. If several children are being tested set them as far apart as possible. Give the 3 sample questions. Check the sample questions and correct errors before going on to the test questions. Both booklets can be given in a single session. They may be given in 2 separate sessions. A booklet should not be administered in more than one session. The detailed directions for each booklet should be followed exactly. There are key phrases in each item that are read twice, with emphasis on the italicized words. The child/children should be given enough time to respond to each question before going on to the next question. It is allowable to help the child/children to keep their place. They may correct either sample or test questions.

Norms. A single score only is presented for kindergarten, 1st, and 2nd grade children.

Validity and Reliability. Validity and reliability are not specified.

Comments. Administering the Boehm Test of Basic Concepts is simple and straightforward. It usually is enjoyable and interesting to children so it holds their attention. It lets one know what concepts a child is having trouble with so they can be worked on. It can be administered individually or in small group. If given to a group of children they may copy from each other, thus making their scores not really accurate representations of their abilities. Some of the items may not have clear answers in the eyes of a child. More research is needed on the reliability and validity of the test and better normative data would be helpful.

BASIC CONCEPT INVENTORY

BASIC CONCEPTS COMPREHENSION

Author: Siegfried Engelmann

Publisher: Follett Educational Corp.
Department DM
P.O. Box 5705
1010 W. Washington Blvd.
Chicago, Illinois 60607

Cost: $19.32 for complete set, manual, picture cards, forms

Age Range: Four to ten years (four to six recommended)

Date: 1967

Administration Time: 15 to 20 minutes

Purpose: To evaluate what concepts of learning a child has acquired. Can be used by classroom teacher for remedial instruction and used by therapist for diagnosis.

Description

The test has three parts: (1) A multi-object picture is presented along with an instruction such as, "Find the man." The task is designed to test child's handling of selection criteria, ability to follow instructions, and size of lexicon. (2) Clinician makes statement such as, "A boy is not walking when he is running" and asks the implied question, "What is a boy not doing when he is running?" The child must repeat statement and answer question. (3) Tests child's understanding of patterns (example, 7-4 77-44...)

Scoring. Scoring of the test is easy and objective. A low score equals good performance since points are given for wrong answers. The test was designed to be used with culturally disadvantaged pre-schoolers and kindergartners, slow learners, emotionally disturbed and mentally retarded children.

Reliability and validity studies are forthcoming since this is an experimental version. There are no age norms available.

Comments. The test is good because it is not rigid or dogmatic. Engelmann wisely cautions the user about its shortcomings and about interpreting results. Pictures are not confusing, though they are black and white.

VOCABULARY COMPREHENSION SCALE(VCS) - BASIC CONCEPTS-COMPREHENSION

Author:	T.E. Bangs	Publisher:	Learning Concepts 2501 N. Lamar Austin, Texas 78705
Cost:	$34.95	Age Range:	2-6 years
Date:	1975	Administration time:	5 to 10 minutes

Purpose: To provide teacher's of language/learning handicapped children with baseline information related to comprehension of pronouns and words of position, quality, quantity, and size.

Description

Procedure. The examiner should become familiar with the items on the scale. The child is required to name or point to all of the objects used in the Scale before the examiner proceeds with the assessment. The examiner should administer all of the items according to the directions given on the scoring form. The examiner makes the judgement as to when the test should be terminated. Directions should be repeated if requested by the child. The examiner then transfers the child's scores on the Scoring Form to the respective numbers on the Summary section.

Scoring. The Scoring Form includes directions for eliciting responses from the child and spaces for recording pass or fail. The Summary section provides a quick view of the pass and fail items plus a system for measuring gains over time.

Norms. The VCS provides charts that can give an examiner the approximate age level for each category obtained by the child. A total vocabulary comprehension score can be ascertained in the same manner.

Comments. This is a very new test. It is similar in some ways to Boehm's or Engelman's test. Many of the material that came with the test are made of cardboard and seem to deteriorate with extensive use. The norms are better than other tests in this area.

March 1, 1976

4th Edition Draft

Language Acquisition and Assessment in Normal and Handicapped Preschool Children

A Bibliography[1]

by Thomas M. Longhurst[2], Megan King, Janice Parr, Anne Ahlers,
Mary Ann Keating, Joan C. Boeding, and Karen Bonewitz

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[1] The preparation of this bibliography was supported in part by a grant from Kansas Neurological Institute - USOE - School Systems and Handicapped Branch No. R0077FPA entitled Assessment of Language Training for Preschool Handicapped Children. The bibliography specifically excludes materials related to prelinguistic development (before first word), language training, and language in bidialectal, bilingual, or economically disadvantaged children. It also excludes articles not published in English and generally excludes articles that relate to children learning other languages. Also excluded are articles or books published before about 1940 unless they particular interest or merit. Slobin's (1972) updating of Leopold's (1952) bibliography contains many older sources or sources in other languages.

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